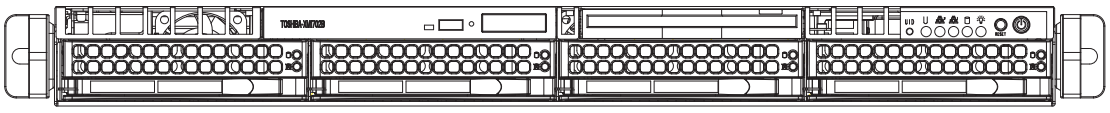
SUPERMICRO®

SUPERSERVER 6016T-URF
SUPERSERVER 6016T-UF
SUPERSERVER 6016T-NTRF
SUPERSERVER 6016T-NTF



USER'S MANUAL

1.0

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Preface

About This Manual

This manual is written for professional system integrators and PC technicians. It provides information for the installation and use of the SuperServer 6016T-URF/6016T-UF/6016T-NTRF/6016T-NTF. Installation and maintenance should be performed by experienced technicians only.

Manual Organization

Chapter 1: Introduction

The first chapter provides a checklist of the main components included with the server system and describes the main features of the X8DTU-F serverboard and the SC815TQ-R650UBP/SC815TQ-560UBP chassis, which comprise the SuperServer 6016T-URF/6016T-UF/6016T-NTRF/6016T-NTF.

Chapter 2: Server Installation

This chapter describes the steps necessary to install the SuperServer into a rack and check out the server configuration prior to powering up the system. If your server was ordered without processor and memory components, this chapter will refer you to the appropriate sections of the manual for their installation.

Chapter 3: System Interface

Refer here for details on the system interface, which includes the functions and information provided by the control panel on the chassis as well as other LEDs located throughout the system.

Chapter 4: System Safety

You should thoroughly familiarize yourself with this chapter for a general overview of safety precautions that should be followed when installing and servicing the SuperServer 6016T-URF/6016T-UF/6016T-NTRF/6016T-NTF.

Chapter 5: Advanced Serverboard Setup

Chapter 5 provides detailed information on the X8DTU-F serverboard, including the locations and functions of connections, headers and jumpers. Refer to this chapter when adding or removing processors or main memory and when reconfiguring the serverboard.

Chapter 6: Advanced Chassis Setup

Refer to Chapter 6 for detailed information on the SC815TQ-R650UBP/SC815TQ-560UBP server chassis. You should follow the procedures given in this chapter when installing, removing or reconfiguring SATA or peripheral drives and when replacing system power supply modules and cooling fans.

Chapter 7: BIOS

The BIOS chapter includes an introduction to BIOS and provides detailed information on running the CMOS Setup Utility.

Appendix A: BIOS Error Beep Codes

Appendix B: Installing Windows

Appendix C: System Specifications

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Appendix A BIOS Error Beep Codes

Appendix B Installing Windows

Appendix C System Specifications

Chapter 1

Introduction

1-1 Overview

The SuperServer 6016T-URF/6016T-UF/6016T-NTRF/6016T-NTF is a high-end server comprised of two main subsystems: the SC815TQ-R650UBP (6016T-URF/6016T-NTRF)/SC815TQ-560UBP (6016T-UF/6016T-NTF) 1U server chassis and the X8DTU-F dual processor serverboard. Please refer to our web site for information on operating systems that have been certified for use with the system (www.supermicro.com).

In addition to the serverboard and chassis, various hardware components have been included with the 6016T-URF/6016T-UF/6016T-NTRF/6016T-NTF, as listed below:

- One slim DVD-ROM drive (DVM-TEAC-824B)
- Four sets of 4-cm counter-rotating fans (FAN-0086L4)
- One air shroud (MCP-310-18001-0N)
- One DVD-ROM drive cable (CBL-0061)
- Two passive CPU heatsinks (SNK-P0037)
- Riser Cards: (see Section 5-6 for details)
  One RSC-R1UU-UE16 for PCI-E card (6016T-URF/6016T-UF only)
  One RSC-R1UU-2E8 for two PCI-E cards (6016T-NTRF/6016T-NTF only)
- SATA Accessories
  One SATA backplane (BPN-SAS-815TQ)
  One SATA iPASS cable (CBL-0188L) (6016T-URF/6016T-UF only)
  Four SATA drive carriers (MCP-220-00001-01)
  One SATA cable set (CBL-0190L) (6016T-NTRF/6016T-NTF only)
  One SGPIO cable (CBL-0157) (6016T-NTRF/6016T-NTF only)
- One rackmount kit (CSE-PT51L)
- One CD containing drivers and utilities
- SuperServer 6016T-URF/6016T-UF/6016T-NTRF/6016T-NTF User's Manual

1-2 Serverboard Features

At the heart of the SuperServer 6016T-URF/6016T-UF/6016T-NTRF/6016T-NTF lies the X8DTU-F, a dual processor serverboard based on the Intel® IOH-36D (North Bridge) + ICH10R (South Bridge) chipset. Below are the main features of the X8DTU-F. (See Figure 1-1 for a block diagram of the chipset).

Processors

The X8DTU-F supports single or dual two Intel® 5500 Series processors in LGA1366 sockets. Please refer to our web site for a complete listing of supported processors (www.supermicro.com).

Memory

The X8DTU-F has 240-pin DIMM sockets that can support up to 96 GB of registered ECC DDR3-1333/1066/800 SDRAM. Please refer to Chapter 5 for installing memory.

UIO

The X8DTU-F is a specially-designed serverboard that features Supermicro's UIO (Universal I/O) technology. UIO serverboards have a PCI Express x8 slot that can support any one of several types of UIO card types to add SAS ports, additional LAN ports, etc. to the serverboard. This allows the user to tailor the serverboard to their own needs.

Note: the server does not come with a UIO card installed.

Serial ATA

An on-chip (ICH10R) SATA controller is integrated into the X8DTU-F to provide a six-port, 3 Gb/sec SATA subsystem, which is RAID 0, 1, 5 and 10 supported. The SATA drives are hot-swappable units.

Note: You must have RAID set up to enable the hot-swap capability of the SATA drives. Documentation on RAID setup guidelines can be found on our web site.

Onboard Controllers/Ports

The color-coded I/O ports include one COM port, a VGA (monitor) port, two USB 2.0 ports, PS/2 mouse and keyboard ports and two gigabit Ethernet ports.

Graphics Controller

The X8DTU-F features an integrated Matrox G200eW graphics chip, which includes 8 MB of DDR2 memory.

Other Features

Other onboard features that promote system health include onboard voltage monitors, auto-switching voltage regulators, chassis and CPU overheat sensors, virus protection and BIOS rescue.

1-3 Server Chassis Features

The 6016T-URF/6016T-NTRF is built upon the SC815TQ-R650UBP chassis while the 6016T-UF/6016T-NTF is built upon the SC815TQ-560UBP chassis. Details on the chassis and on servicing procedures can be found in Chapter 6.The following is a general outline of the main features of both chassis.

System Power

The SC815TQ-R650UBP features a redundant 650W power supply consisting of two power modules. The system does not need to be shut down when replacing or removing a single power supply module.

The SC815TQ-560UBP features a single 560W power supply module. The system must be shut down when replacing or removing this power supply module.

SATA Subsystem

The SC815TQ-R650UBP/SC815TQ-560UBP chassis was designed to support four hot-swap SATA hard drives.

Note: In the 6016T-NTRF/6016T-NTF, SATA drives are connected to the onboard SATA ports.

PCI Expansion Slots

6016T-URF/6016T-UF: A riser card (RSC-R1UU-E8PR, optional) on the right side of the chassis can support AOC-PG-i2+ add-on card to provide two Gb LAN ports. The left side supports a UIO card and one PCI-E x16 card. These two systems can support four SAS/SATA drives with an optional UIO SAS card. See our web site for details (http://www.supermicro.com/products/nfo/UIO.cfm).

6016T-NTRF/6016T-NTF: A riser card (RSC-R1UU-E8PR, optional) on the right side of the chassis can support AOC-PG-i2+ add-on card to provide two Gb LAN ports. The left side supports two PCI-E x8 cards.

See section 5-6 for details. (Right and left refer to the side when viewed from the front of the system. The 6016T-NTRF/6016T-NTF does not support a UIO card.)

Front Control Panel

The chassis' control panel provides you with system monitoring and control. LEDs indicate system power, HDD activity, network activity (two) and UID/overheat/fan fail/power fail. A main power button, a system reset button and a UID button are also included.

I/O Backplane

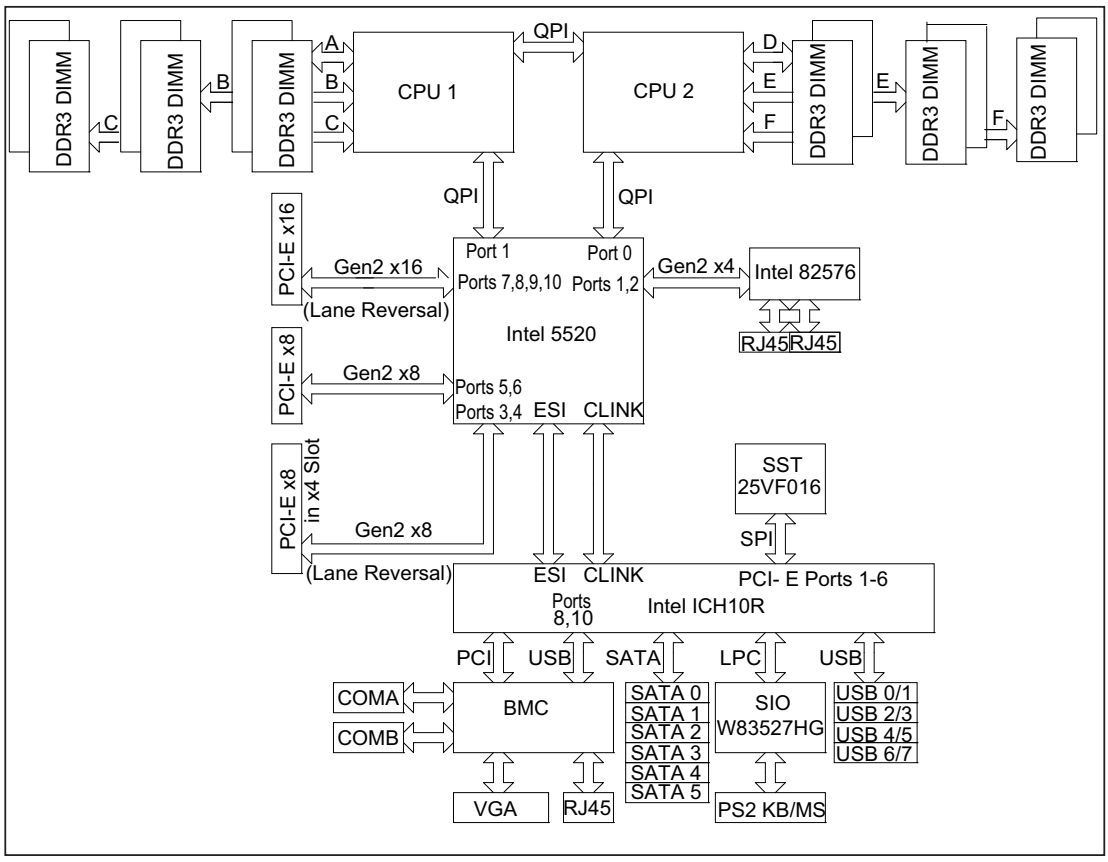
The SC815TQ-R650UBP/SC815TQ-560UBP is an extended ATX form factor chassis that is designed to be used in a 1U rackmount configuration. Ports on the I/O backplane include one COM port, a VGA port, two USB 2.0 ports, PS/2 mouse and keyboard ports and two gigabit Ethernet ports. A UID (Unit Identifier) button and LED are also located beside the LAN2 Ethernet port.

Cooling System

The SC815TQ-R650UBP/SC815TQ-560UBP chassis has an innovative cooling design that features four sets of 4-cm counter-rotating fans located in the middle section of the chassis. There is a "Fan Speed Control Mode" setting in BIOS that allows chassis fan speed to be determined by system temperature. The power supply module also includes a cooling fan.

Figure 1-1. Intel IOH-36D/ICH10R Chipset: System Block Diagram

Note: This is a general block diagram. Please see Chapter 5 for details.



1-4 Contacting Supermicro

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Technical Support:	
Email:	support@supermicro.com.tw
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Chapter 2

Server Installation

2-1 Overview

This chapter provides a quick setup checklist to get your SuperServer 6016T-URF/6016T-UF/6016T-NTRF/6016T-NTF up and running. Following these steps in the order given should enable you to have the system operational within a minimum amount of time. This quick setup assumes that your system has come to you with the processors and memory preinstalled. If your system is not already fully integrated with a serverboard, processors, system memory etc., please turn to the chapter or section noted in each step for details on installing specific components.

2-2 Unpacking the System

You should inspect the box the SuperServer 6016T-URF/6016T-UF/6016T-NTRF/6016T-NTF was shipped in and note if it was damaged in any way. If the server itself shows damage you should file a damage claim with the carrier who delivered it.

Decide on a suitable location for the rack unit that will hold the 6016T-URF/6016T-UF/6016T-NTRF/6016T-NTF. It should be situated in a clean, dust-free area that is well ventilated. Avoid areas where heat, electrical noise and electromagnetic fields are generated. You will also need it placed near a grounded power outlet. Be sure to read the Rack and Server Precautions in the next section.

2-3 Preparing for Setup

The box the SuperServer 6016T-URF/6016T-UF/6016T-NTRF/6016T-NTF was shipped in should include two sets of rail assemblies, two rail mounting brackets and the mounting screws you will need to install the system into the rack. Follow the steps in the order given to complete the installation process in a minimum amount of time. Please read this section in its entirety before you begin the installation procedure outlined in the sections that follow.

Choosing a Setup Location

- Leave enough clearance in front of the rack to enable you to open the front door completely (~25 inches) and approximately 30 inches of clearance in the back of the rack to allow for sufficient airflow and ease in servicing.This product is for installation only in a Restricted Access Location (dedicated equipment rooms, service closets and the like).

- This product is not suitable for use with visual display work place devices acccording to §2 of the the German Ordinance for Work with Visual Display Units.

Warnings and Precautions!

Rack Precautions

- Ensure that the leveling jacks on the bottom of the rack are fully extended to the floor with the full weight of the rack resting on them.

- In single rack installation, stabilizers should be attached to the rack. In multiple rack installations, the racks should be coupled together.

- Always make sure the rack is stable before extending a component from the rack.

- You should extend only one component at a time - extending two or more simultaneously may cause the rack to become unstable.

Server Precautions

- Review the electrical and general safety precautions in Chapter 4.

- Determine the placement of each component in the rack *before* you install the rails.

- Install the heaviest server components on the bottom of the rack first, and then work up.

- Use a regulating uninterruptible power supply (UPS) to protect the server from power surges, voltage spikes and to keep your system operating in case of a power failure.

- Allow the hot plug SATA drives and power supply modules to cool before touching them.

- Always keep the rack's front door and all panels and components on the servers closed when not servicing to maintain proper cooling.

Rack Mounting Considerations

Ambient Operating Temperature

If installed in a closed or multi-unit rack assembly, the ambient operating temperature of the rack environment may be greater than the ambient temperature of the room. Therefore, consideration should be given to installing the equipment in an environment compatible with the manufacturer's maximum rated ambient temperature (Tmra).

Reduced Airflow

Equipment should be mounted into a rack so that the amount of airflow required for safe operation is not compromised.

Mechanical Loading

Equipment should be mounted into a rack so that a hazardous condition does not arise due to uneven mechanical loading.

Circuit Overloading

Consideration should be given to the connection of the equipment to the power supply circuitry and the effect that any possible overloading of circuits might have on overcurrent protection and power supply wiring. Appropriate consideration of equipment nameplate ratings should be used when addressing this concern.

Reliable Ground

A reliable ground must be maintained at all times. To ensure this, the rack itself should be grounded. Particular attention should be given to power supply connections other than the direct connections to the branch circuit (i.e. the use of power strips, etc.).

2-4 Installing the System into a Rack

This section provides information on installing the 6016T-URF/6016T-UF/6016T-NTRF/6016T-NTF into a rack unit with the rack rails provided. If the system has already been mounted into a rack, you can skip ahead to Sections 2-5 and 2-6.

There are a variety of rack units on the market, which may mean the assembly procedure will differ slightly. You should also refer to the installation instructions that came with the rack unit you are using.

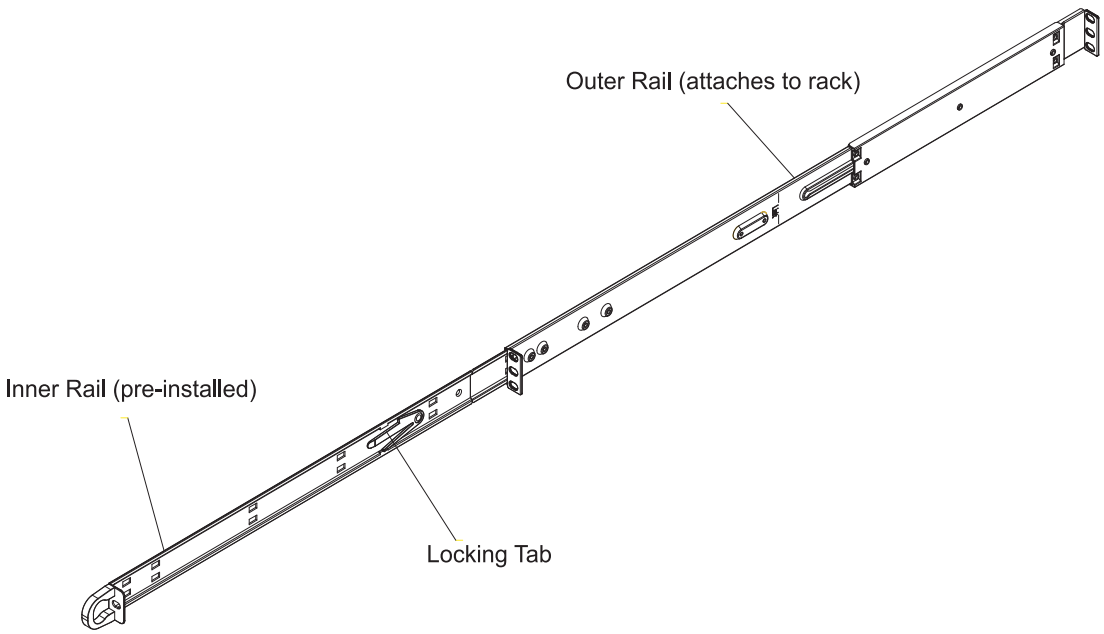
Identifying the Sections of the Rack Rails

You should have received two rack rail assemblies in the rack mounting kit. Each assembly consists of two sections: an inner fixed chassis rail that secures directly to the server chassis and an outer fixed rack rail that secures directly to the rack itself (see Figure 2-1). Two pairs of short brackets to be used on the front side of the outer rails are also included.

Installing the Inner Rails

Both the left and right side inner rails have been pre-attached to the chassis. Proceed to the next step.

Figure 2-1. Identifying the Sections of the Rack Rails (right side rail shown)

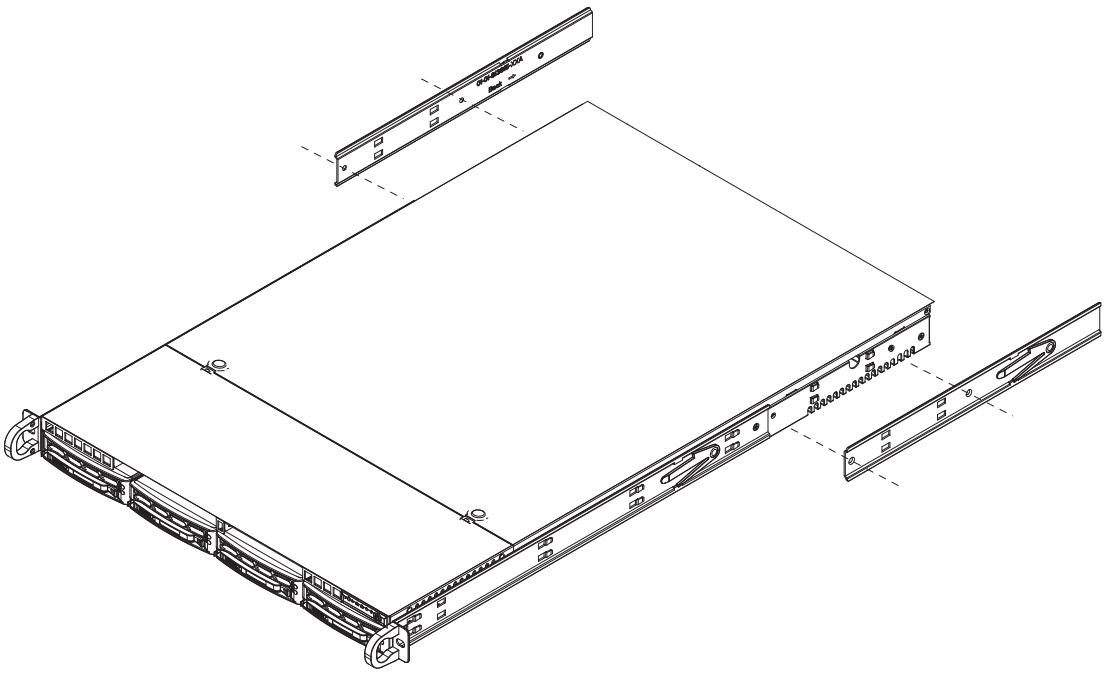


Installing the Outer Rails

Begin by measuring the distance from the front rail to the rear rail of the rack. Attach a short bracket to the front side of the right outer rail and a long bracket to the rear side of the right outer rail. Adjust both the short and long brackets to the proper distance so that the rail can fit snugly into the rack. Secure the short bracket to the front side of the outer rail with two screws and the long bracket to the rear side of the outer rail with three screws. Repeat these steps for the left outer rail.

Locking Tabs: Both chassis rails have a locking tab, which serves two functions. The first is to lock the server into place when installed and pushed fully into the rack, which is its normal position. Secondly, these tabs also lock the server in place when fully extended from the rack. This prevents the server from coming completely out of the rack when you pull it out for servicing.

Figure 2-2. Installing the Rack Rails

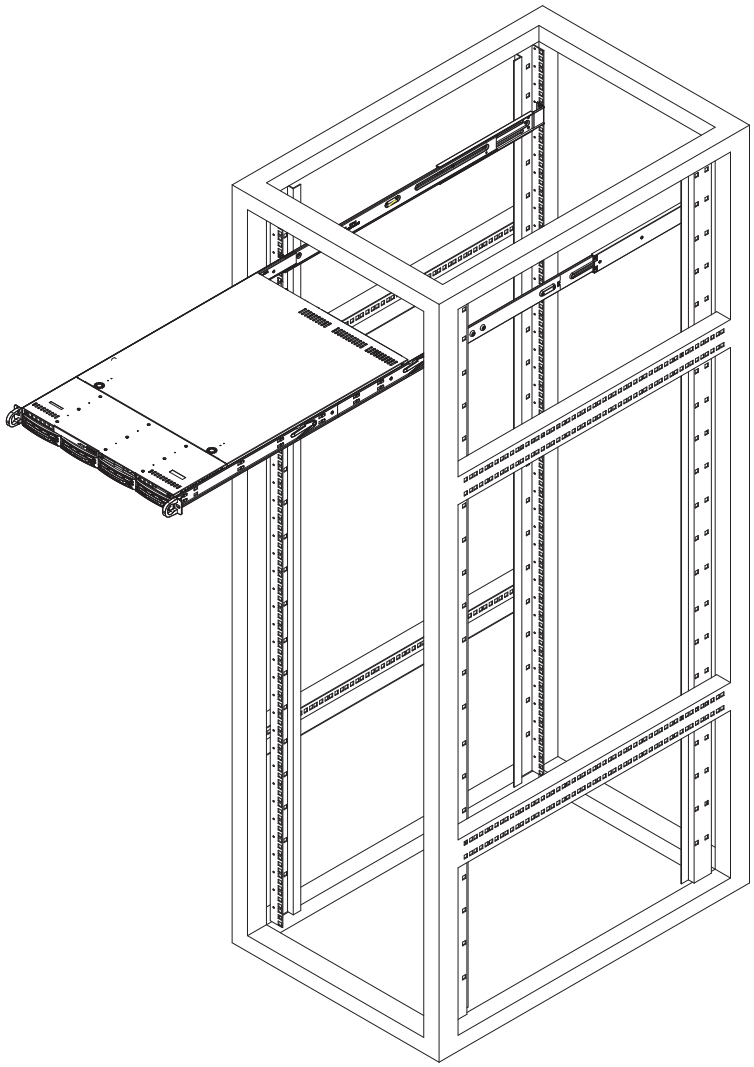


Installing the Server into the Rack

You should now have rails attached to both the chassis and the rack unit. The next step is to install the server into the rack. Do this by lining up the rear of the chassis rails with the front of the rack rails. Slide the chassis rails into the rack rails, keeping the pressure even on both sides (you may have to depress the locking tabs when inserting). See Figure 2-3.

When the server has been pushed completely into the rack, you should hear the locking tabs "click".

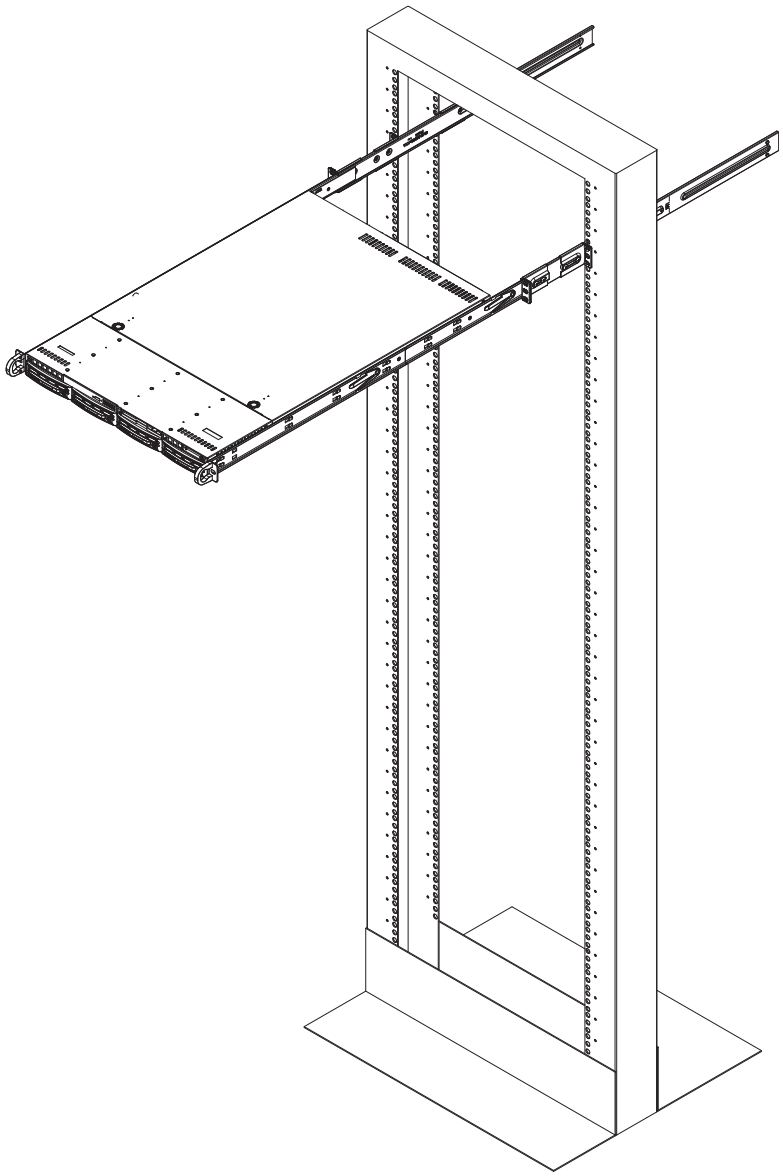
Figure 2-3. Installing the Server into a Rack



Installing the Server into a Telco Rack

To install the 6016T-URF/6016T-UF/6016T-NTRF/6016T-NTF into a Telco type rack, use two L-shaped brackets on either side of the chassis (four total). First, determine how far follow the server will extend out the front of the rack. Larger chassis should be positioned to balance the weight between front and back. If a bezel is included on your server, remove it. Then attach the two front brackets to each side of the chassis, then the two rear brackets positioned with just enough space to accommodate the width of the telco rack. Finish by sliding the chassis into the rack and tightening the brackets to the rack.

Figure 2-4. Installing the Server into a Telco Rack



2-5 Checking the Serverboard Setup

After you install the 6016T-URF/6016T-UF/6016T-NTRF/6016T-NTF in the rack, you will need to open the top cover to make sure the serverboard is properly installed and all the connections have been made.

Accessing the Inside of the System

1. First, grasp the two handles on either side and pull the system straight out until it locks (you will hear a "click").

2. Depress the two buttons on the top of the chassis to release the top cover (1).

3. Push the cover away from you (toward the rear of the chassis) until it stops (2). You can then lift the top cover from the chassis to gain full access to the inside of the server. See Figure 2-5.

4. To remove the system from the rack completely, depress the locking tabs in the chassis rails (push the right-side tab down and the left-side tab up) to continue to pull the system out past the locked position.

Checking the Components

1. You may have one or two processors already installed in the serverboard. Each processor needs its own heatsink. See Chapter 5 for instructions on processor and heatsink installation.

2. Your server system may have come with system memory already installed. Make sure all DIMMs are fully seated in their slots. For details on adding system memory, refer to Chapter 5.

3. If desired, you can install add-on cards to the system. See Chapter 5 for details on installing PCI add-on cards.

4. Make sure all power and data cables are properly connected and not blocking the chassis airflow. See Chapter 5 for details on cable connections.

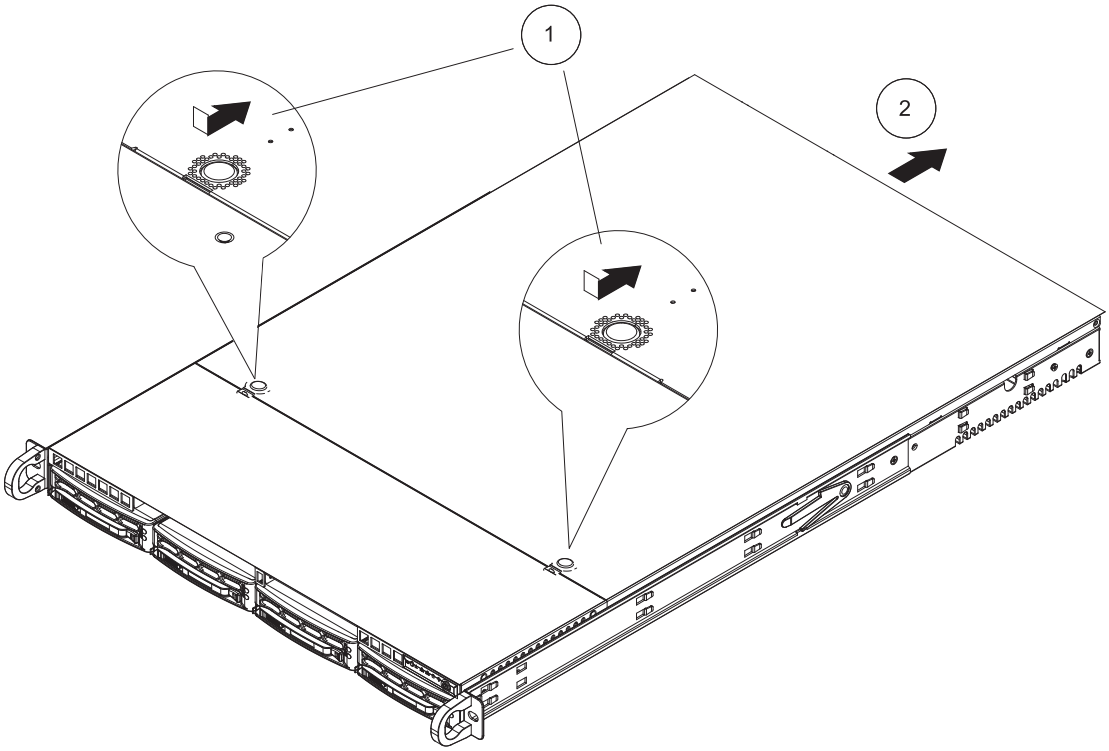


Figure 2-5. Accessing the Inside of the System

2-6 Checking the Drive Bay Setup

Next, you should check to make sure the peripheral drives and the SATA drives and SATA backplane have been properly installed and all connections have been made.

Checking the Drives

1. All drives are accessable from the front of the server. The SATA disk drives can be installed and removed from the front of the chassis without removing the top chassis cover.

2. A slim DVD-ROM drive should be preinstalled in your server. For servicing the DVD-ROM drive, you will need to remove the top chassis cover. Refer to Chapter 6 if you need to reinstall a DVD-ROM drive to the system.

3. Depending upon your system's configuration, your system may have one or more drives already installed. If you need to install SATA drives, please refer to Chapter 6.

Checking the Airflow

1. Airflow is provided by four sets of 4-cm fans (each set of fans consists of two fans that are mounted back to back). The system component layout was carefully designed to direct sufficient cooling airflow to the components that generate the most heat.

2. Note that all power and data cables have been routed in such a way that they do not block the airflow generated by the fans.

Providing Power

1. The last thing you must do is to provide input power to the system. Plug the power cords from the power supply modules into a high-quality power strip that offers protection from electrical noise and power surges.

2. It is recommended that you use an uninterruptible power supply (UPS).

Chapter 3

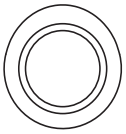
System Interface

3-1 Overview

There are several LEDs on the control panel as well as others on the SATA drive carriers to keep you constantly informed of the overall status of the system as well as the activity and health of specific components. There are also two buttons on the chassis control panel and an on/off switch on the power supply. This chapter explains the meanings of all LED indicators and the appropriate response you may need to take.

3-2 Control Panel Buttons

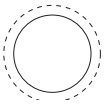
There are three push-buttons located on the front of the chassis: a reset button, a UID button and a power on/off button.



UID

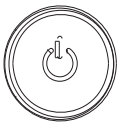
Depressing the UID (unit identifier) button illuminates an LED on both the front and rear of the chassis for easy system location in large stack configurations. The LED will remain on until the button is pushed a second time. Another UID button on the rear of the chassis serves the same function.

RESET



Reset

Use the reset button to reboot the system.



Power

The main power button is used to apply or remove power from the power supply to the server system. Turning off system power with this button removes the main power but keeps standby power supplied to the system.

3-3 Control Panel LEDs

The control panel located on the front of the SC815TS-R560U/SC815TS-560UBP chassis has five LEDs. These LEDs provide you with critical information related to different parts of the system. This section explains what each LED indicates when illuminated and any corrective action you may need to take.

Universal Information LED

When this LED blinks red quickly, it indicates a fan failure and when blinking red slowly a power failure. The LED will be blue when used for UID (Unit Identifier). When on continuously it indicates an overheat condition, which may be caused by cables obstructing the airflow in the system or the ambient room temperature being too warm. Check the routing of the cables and make sure all fans are present and operating normally. You should also check to make sure that the chassis covers are installed. Finally, verify that the heatsinks are installed properly (see Chapter 5). This LED will remain flashing or on as long as the indicated condition exists. See the table below for descriptions of the LED states.

Figure 3-1. Universal Information LED States

Universal Information LED States	
State	Indication
Fast Blinking Red (1x/sec)	Fan Fail
Solid Red	CPU Overheat
Slow Blinking Red (1x/4 sec)	Power Fail
Solid Blue	Local UID Button Depressed
Blinking Blue	IPMI-Activated UID

Note: deactivating the UID LED must be performed in the same way it was activated. (If the UID LED was activated via IPMI, you can only turn the LED off via IPMI and not with the UID button.)

NIC2

Indicates network activity on LAN2 when flashing.

NIC1

Indicates network activity on LAN1 when flashing.

HDD

On the SuperServer 6016T-URF/6016T-UF/6016T-NTRF/6016T-NTF, this light indicates SATA and/or DVD-ROM drive activity when flashing.

Power

Indicates power is being supplied to the system's power supply units. This LED should normally be illuminated when the system is operating.

3-4 Hard Drive Carrier LEDs

Each hard drive carrier has two LEDs.

- **Green:** When illuminated, the green LED on the front of the drive carrier indicates drive activity. A connection to the drive backplane enables this LED to blink on and off when that particular drive is being accessed.

- **Red:** The red LED indicates two states. When blinking, it indicates the drive is rebuilding. When solid, it indicates a drive failure. If a hard drive fails, you should be notified by your system management software. Please refer to Chapter 6 for instructions on replacing failed hard drives.

Chapter 4

System Safety

4-1 Electrical Safety Precautions

Basic electrical safety precautions should be followed to protect yourself from harm and the SuperServer 6016T-URF/6016T-UF/6016T-NTRF/6016T-NTF from damage:

- Be aware of the locations of the power on/off switch on the chassis as well as the room's emergency power-off switch, disconnection switch or electrical outlet. If an electrical accident occurs, you can then quickly remove power from the system.

- Do not work alone when working with high voltage components.

- Power should always be disconnected from the system when removing or installing main system components, such as the serverboard, memory modules and floppy drive. When disconnecting power, you should first power down the system with the operating system first and then unplug the power cords of all the power supply units in the system.

- When working around exposed electrical circuits, another person who is familiar with the power-off controls should be nearby to switch off the power if necessary.

- Use only one hand when working with powered-on electrical equipment. This is to avoid making a complete circuit, which will cause electrical shock. Use extreme caution when using metal tools, which can easily damage any electrical components or circuit boards they come into contact with.

- Do not use mats designed to decrease static electrical discharge as protection from electrical shock. Instead, use rubber mats that have been specifically designed as electrical insulators.

- The power supply power cords must include a grounding plug and must be plugged into grounded electrical outlets.

- Serverboard Battery: **CAUTION** - There is a danger of explosion if the onboard battery is installed upside down, which will reverse its polarites (see Figure 4-1). This battery must be replaced only with the same or an equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions.

- DVD-ROM Laser: **CAUTION** - this server may have come equipped with a DVD-ROM drive. To prevent direct exposure to the laser beam and hazardous radiation exposure, do not open the enclosure or use the unit in any unconventional way.

- Mainboard replaceable soldered-in fuses: Self-resetting PTC (Positive Temperature Coefficient) fuses on the mainboard must be replaced by trained service technicians only. The new fuse must be the same or equivalent as the one replaced. Contact technical support for details and support.

4-2 General Safety Precautions

Follow these rules to ensure general safety:

- Keep the area around the system clean and free of clutter.

- The 6016T-URF/6016T-UF/6016T-NTRF/6016T-NTF weighs approximately 43/41 lbs (19.5/18.6 kg) when fully loaded. When lifting the system, two people at either end should lift slowly with their feet spread out to distribute the weight. Always keep your back straight and lift with your legs.

- Place the chassis top cover and any system components that have been removed away from the system or on a table so that they won't accidentally be stepped on.

- While working on the system, do not wear loose clothing such as neckties and unbuttoned shirt sleeves, which can come into contact with electrical circuits or be pulled into a cooling fan.

- Remove any jewelry or metal objects from your body, which are excellent metal conductors that can create short circuits and harm you if they come into contact with printed circuit boards or areas where power is present.

- After accessing the inside of the system, close the system back up and secure it to the rack unit after ensuring that all connections have been made.

4-3 ESD Precautions

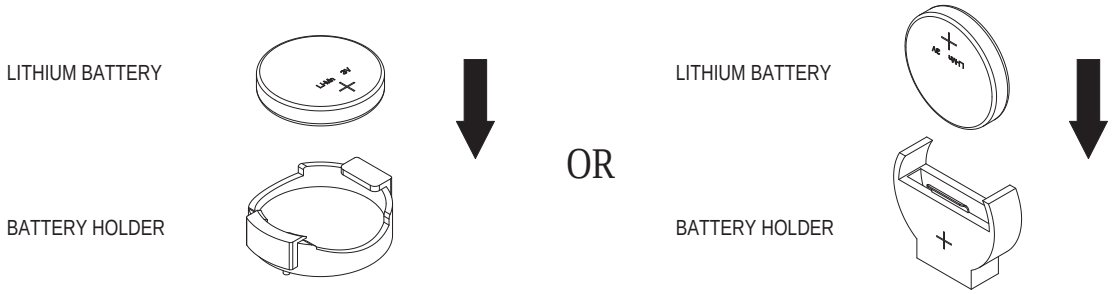
Electrostatic discharge (ESD) is generated by two objects with different electrical charges coming into contact with each other. An electrical discharge is created to neutralize this difference, which can damage electronic components and printed circuit boards. The following measures are generally sufficient to neutralize this difference before contact is made to protect your equipment from ESD:

- Use a grounded wrist strap designed to prevent static discharge.
- Keep all components and printed circuit boards (PCBs) in their antistatic bags until ready for use.
- Touch a grounded metal object before removing the board from the antistatic bag.
- Do not let components or PCBs come into contact with your clothing, which may retain a charge even if you are wearing a wrist strap.
- Handle a board by its edges only; do not touch its components, peripheral chips, memory modules or contacts.
- When handling chips or modules, avoid touching their pins.
- Put the serverboard and peripherals back into their antistatic bags when not in use.
- For grounding purposes, make sure your computer chassis provides excellent conductivity between the power supply, the case, the mounting fasteners and the serverboard.

4-4 Operating Precautions

Care must be taken to assure that the chassis cover is in place when the 6016T-URF/6016T-UF/6016T-NTRF/6016T-NTF is operating to assure proper cooling. Out of warranty damage to the system can occur if this practice is not strictly followed.

Figure 4-1. Installing the Onboard Battery



Chapter 5

Advanced Serverboard Setup

This chapter covers the steps required to install processors and heatsinks to the X8DTU-F serverboard, connect the data and power cables and install add-on cards. All serverboard jumpers and connections are described and a layout and quick reference chart are included in this chapter. Remember to close the chassis completely when you have finished working on the serverboard to protect and cool the system sufficiently.

5-1 Handling the Serverboard

Static electrical discharge can damage electronic components. To prevent damage to printed circuit boards, it is important to handle them very carefully (see Chapter 4). Also note that the size and weight of the serverboard can cause it to bend if handled improperly, which may result in damage. To prevent the serverboard from bending, keep one hand under the center of the board to support it when handling.

The following measures are generally sufficient to protect your equipment from static discharge.

Precautions

- Use a grounded wrist strap designed to prevent static discharge.
- Touch a grounded metal object before removing any board from its antistatic bag.
- Handle a board by its edges only; do not touch its components, peripheral chips, memory modules or gold contacts.
- When handling chips or modules, avoid touching their pins.
- Put the serverboard, add-on cards and peripherals back into their antistatic bags when not in use.

Unpacking

The serverboard is shipped in antistatic packaging to avoid static damage. When unpacking the board, make sure the person handling it is static protected.

5-2 Processor and Heatsink Installation

When handling the processor, avoid placing direct pressure on the label area of the fan. Also, do not place the serverboard on a conductive surface, which can damage the BIOS battery and prevent the system from booting up.

IMPORTANT! Always connect the power cord last and remove it first before adding, removing or changing any hardware components. Make sure that you install the processor into the CPU socket *before* you install the heatsink and fan. The X8DTU-F can support either one or two processors. If installing one processor only, install it into the CPU1 socket.

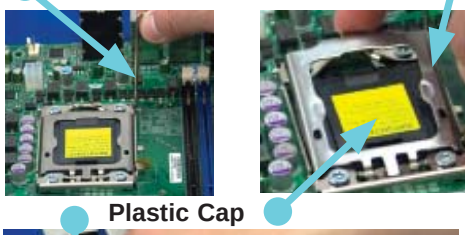
Note:

When purchasing a CPU or when receiving a serverboard with a CPU pre-installed, make sure that the CPU plastic cap is in place and none of the CPU pins are bent; otherwise, contact the retailer immediately.

Installing LGA1366 Processors

1. Starting with CPU1, press the socket clip to release the load plate, which covers the CPU socket, from its locked position.
2. Gently lift the socket clip to open the load plate.
3. Hold the plastic cap at its north and south center edges to remove it from the CPU socket.

Note: The photos on this page and succeeding pages are for illustration purposes only. They do not necessarily reflect the exact product(s) described in this manual.



Holding the north & south edges

1. After removing the plastic cap, use your thumb and the index finger to hold the CPU at the north and south center edges.

2. Align the CPU key (the semi-circle cutout) with the socket key (the notch below the gold color dot on the side of the socket).

3. Once the CPU and the socket are aligned, carefully lower the CPU straight down into the socket. Do not rub the CPU against the surface of the socket or its pins to avoid damaging the CPU or the socket.

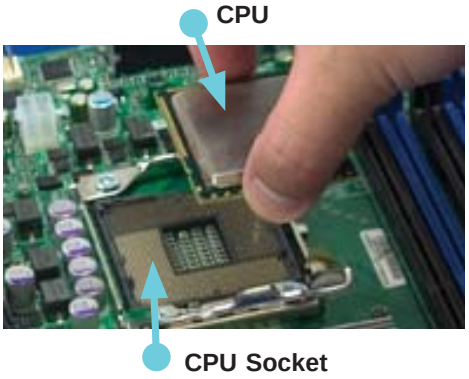
4. With the CPU in the socket, inspect the four corners of the CPU to make sure that it sits level and is properly installed.

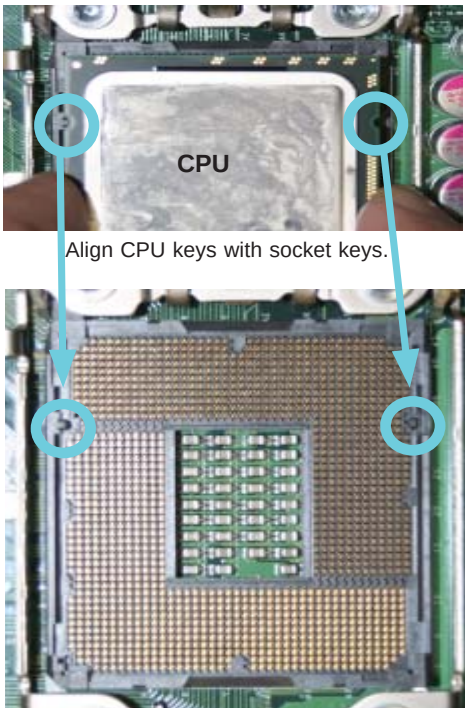
5. Once the CPU is securely seated in the socket, lower the CPU load plate to the socket.

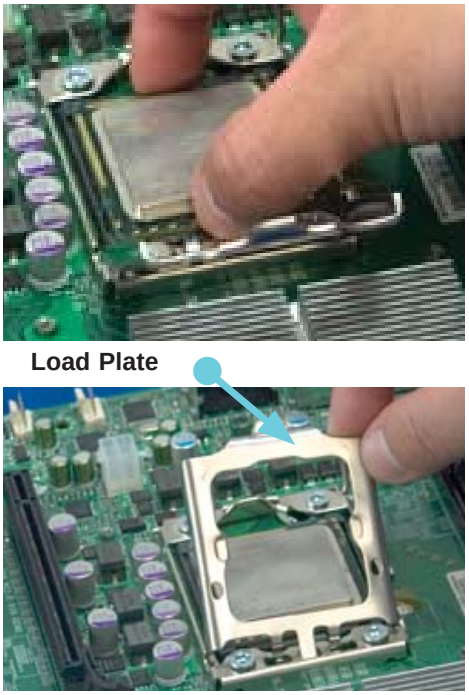
6. Use your thumb to gently push the socket clip down to the clip lock.

7. Repeat for the CPU2 socket for a dual-processor configuration.

Important! Please save the plastic cap. The serverboard must be shipped with the plastic cap properly installed to protect the CPU socket pins. Shipment without the plastic cap properly installed may cause damage to the socket pins.







Installing the Heatsink

1. Place the heatsink on top of the CPU so that the four mounting holes are aligned with those on the retention mechanism.

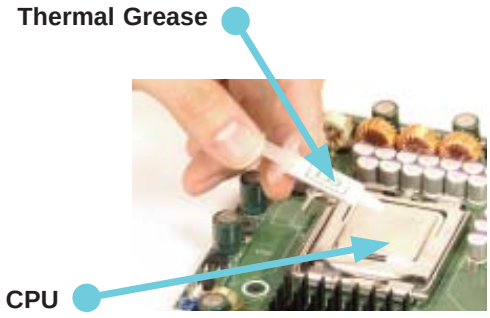
2. Remove the thin layer of protective film from the copper core of the heatsink.

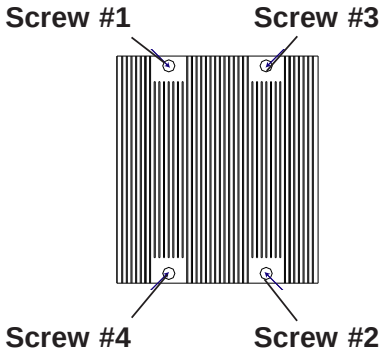
Warning: The CPU may overheat if the protective film is not removed from the heatsink.

3. Apply the proper amount of thermal grease on the CPU. If your heatsink came with a thermal pad, please ignore this step.

4. Screw in two diagonal screws (i.e. the #1 and the #2 screws) until just snug (do not over-tighten the screws, which may damage the CPU.)

5. Finish the installation by fully tightening all four screws.





Removing the Heatsink

Warning: We do not recommend removing the CPU or the heatsink. If you do need to remove the heatsink, please follow the instructions below to prevent damage to the CPU or other components.

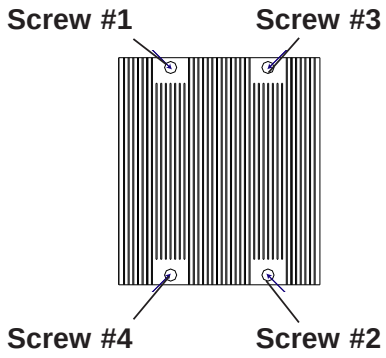
1. Unplug the power cord from the power supply.

1. Unscrew and remove the heatsink screws in the sequence shown in the picture below.

2. Hold the heatsink and gently wiggle it to loosen it from the CPU. (Do not use excessive force when doing this!)

3. Once the heatsink is loosened, remove it from the CPU.

4. Clean the surface of the CPU and the heatsink to get rid of the old thermal grease. Reapply the proper amount of thermal grease before you re-install the heatsink.



5-3 Connecting Cables

Now that the processors are installed, the next step is to connect the cables to the serverboard. These include the data (ribbon) cables for the peripherals and control panel and the power cables.

Connecting Data Cables

The cables used to transfer data from the peripheral devices have been carefully routed in preconfigured systems to prevent them from blocking the flow of cooling air that moves through the system from front to back. If you need to disconnect any of these cables, you should take care to reroute them as they were originally after reconnecting them (make sure the red wires connect to the pin 1 locations). If you are configuring the system, keep the airflow in mind when routing the cables.

The following data cables (with their serverboard connector locations noted) should be connected. See the serverboard layout diagram in this chapter for connector locations.

- DVD-ROM drive cable (SATA4)
- SATA cables (SATA0 ~ SATA3, 6016T-NTF/6016T-NTRF only)
- Control Panel cable (JF1, see next page)

Connecting Power Cables

The X8DTU-F has a 20-pin primary power supply connector designated "JPW1" for connection to the ATX power supply. Connect the appropriate connector from the power supply to JPW1 to supply power to the serverboard. See the Connector Definitions section in this chapter for power connector pin definitions.

In addition, your power supply must be connected to the 8-pin Processor Power connectors at JPW2 and JPW3.

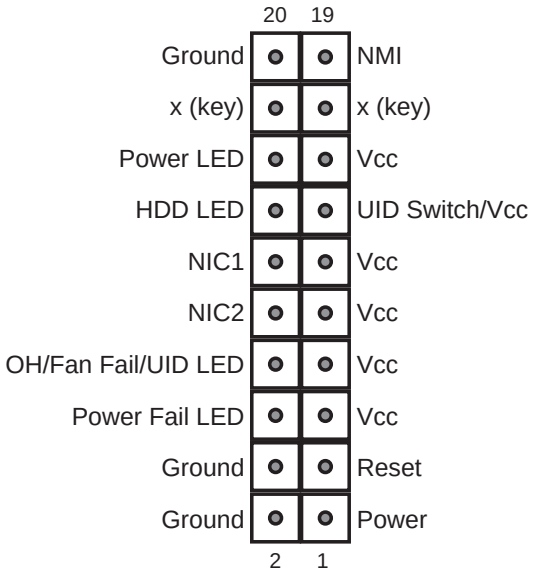
Connecting the Control Panel

JF1 contains header pins for various front control panel connectors. See Figure 5-1 for the pin locations of the various front control panel buttons and LED indicators. Please note that even and odd numbered pins are on opposite sides of each header.

All JF1 wires have been bundled into single keyed ribbon cable to simplify their connection. The red wire in the ribbon cable plugs into pin 1 of JF1. Connect the other end of the cable to the Control Panel printed circuit board, located just behind the system status LEDs in the chassis.

See the Connector Definitions section in this chapter for details and pin descriptions of JF1.

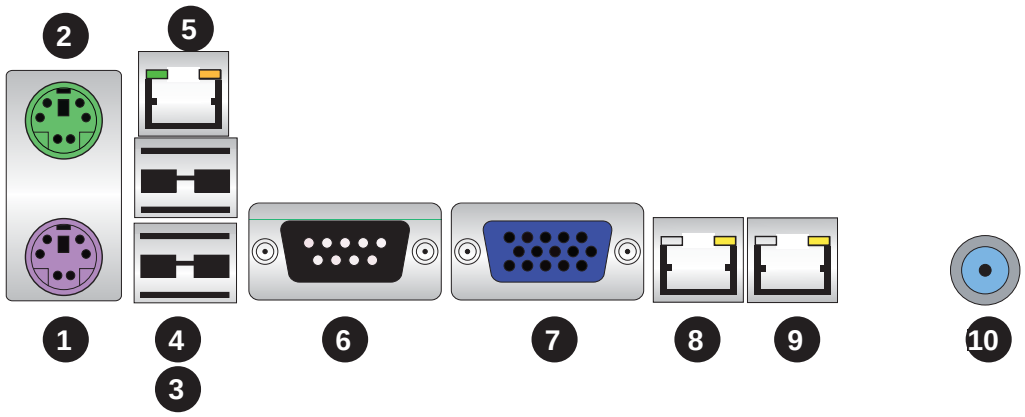
Figure 5-1. Front Control Panel Header Pins (JF1)



5-4 I/O Ports

The I/O ports are color coded in conformance with the PC 99 specification. See Figure 5-2 below for the colors and locations of the various I/O ports.

Figure 5-2. Rear Panel I/O Ports



Rear I/O Ports	
1. Keyboard	6. COM1
2. PS/2 Mouse	7. VGA Port
3. USB0	8. LAN1
4. USB1	9. LAN2
5. IPMI LAN	10. UID Button

5-5 Installing Memory

Note: Check the Supermicro web site for recommended memory modules.

CAUTION

Exercise extreme care when installing or removing DIMM modules to prevent any possible damage.

Installing DIMMs

1. Insert the desired number of DIMMs into the memory slots, starting with slot P1-DIMM1A. For best performance, install memory modules of the same type and same speed in the slots as indicated in the tables below.

2. Insert each DIMM vertically into its slot. Pay attention to the notch along the bottom of the module to prevent inserting the DIMM module incorrectly (see Figure 5-5).

3. Gently press down on the DIMM module until it snaps into place in the slot. Repeat for all modules

Memory Support

The X8DTU-F supports up to 96 GB of registered ECC DDR3-1333/1066/800 SDRAM in 12 slots. (RDIMM modules are supported.)

Notes: Memory speed support depends on the type of CPU used. Due to OS limitations, some operating systems may not show more than 4 GB of memory. Due to

Memory Population for Optimal Performance With One CPU (CPU1) Installed						
	Branch 0		Branch 1		Branch 2	
3 DIMMs	P1 DIMM1A		P1 DIMM2A		P1 DIMM3A	
6 DIMMs	P1 DIMM1A	P1 DIMM1B	P1 DIMM2A	P1 DIMM2B	P1 DIMM3A	P1 DIMM3B

Memory Population for Optimal Performance With One CPU (CPU2) Installed						
	Branch 0		Branch 1		Branch 2	
3 DIMMs	P2 DIMM1A		P2 DIMM2A		P2 DIMM3A	
6 DIMMs	P2 DIMM1A	P2 DIMM1B	P2 DIMM2A	P2 DIMM2B	P2 DIMM3A	P2 DIMM3B

Memory Population for Optimal Performance With Two CPUs Installed												
	CPU1						CPU2					
	Branch 0		Branch 1		Branch 3		Branch 0		Branch 1		Branch 3	
6 DIMMs	1A		2A		3A		1A		2A		3A	
12 DIMMs	1A	1B	2A	2B	3A	3B	1A	1B	2A	2B	3A	3B

memory allocation to system devices, memory remaining available for operational use will be reduced when 4 GB of RAM is used. The reduction in memory availability is disproportional. (Refer to the Memory Availability Table below for details.)

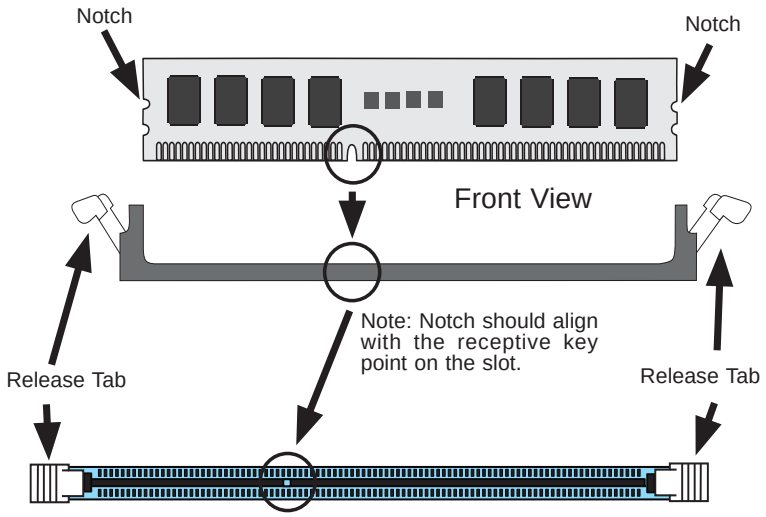
Possible System Memory Allocation & Availability		
System Device	Size	Physical Memory Remaining (4 GB Total System Memory)
Firmware Hub flash memory (System BIOS)	1 MB	3.99
Local APIC	4 KB	3.99
Area Reserved for the chipset	2 MB	3.99
I/O APIC (4 Kbytes)	4 KB	3.99
PCI Enumeration Area 1	256 MB	3.76
PCI Express (256 MB)	256 MB	3.51
PCI Enumeration Area 2 (if needed) -Aligned on 256-MB boundary-	512 MB	3.01
VGA Memory	16 MB	2.85
TSEG	1 MB	2.84
Memory available to System BIOS & OS applications		2.84

DIMM Population Table				
DIMM Slots per Channel	**DIMMs Populated per Channel**	**DIMM Type (Reg.= Registered)**	**Speeds (in MHz)**	**Ranks per DIMM (any combination; SR=Single Rank, DR=Dual Rank, QR=Quad Rank)**
2	1	Reg. DDR3 ECC	800,1066,1333	SR or DR
2	1	Reg. DDR3 ECC	800,1066	QR
2	2	Reg. DDR3 ECC	800,1066	Mixing SR, DR
2	2	Reg. DDR3 ECC	800	Mixing SR, DR,QR

Figure 5-3. Installing DIMM into Slot

To Install: Insert module vertically and press down until it snaps into place. Pay attention to the alignment notch at the bottom.

To Remove:
Use your thumbs to gently push the release tabs near both ends of the module. This should release it from the slot.



Top View of DDR3 Slot

5-6 Adding PCI Cards

PCI Expansion Slots

Riser cards are used to support add-on cards to the system. See the tables below for the expansion cards that may be used in the SC815TQ-R650U/SC815TQ-560U chassis.

PCI Card Installation

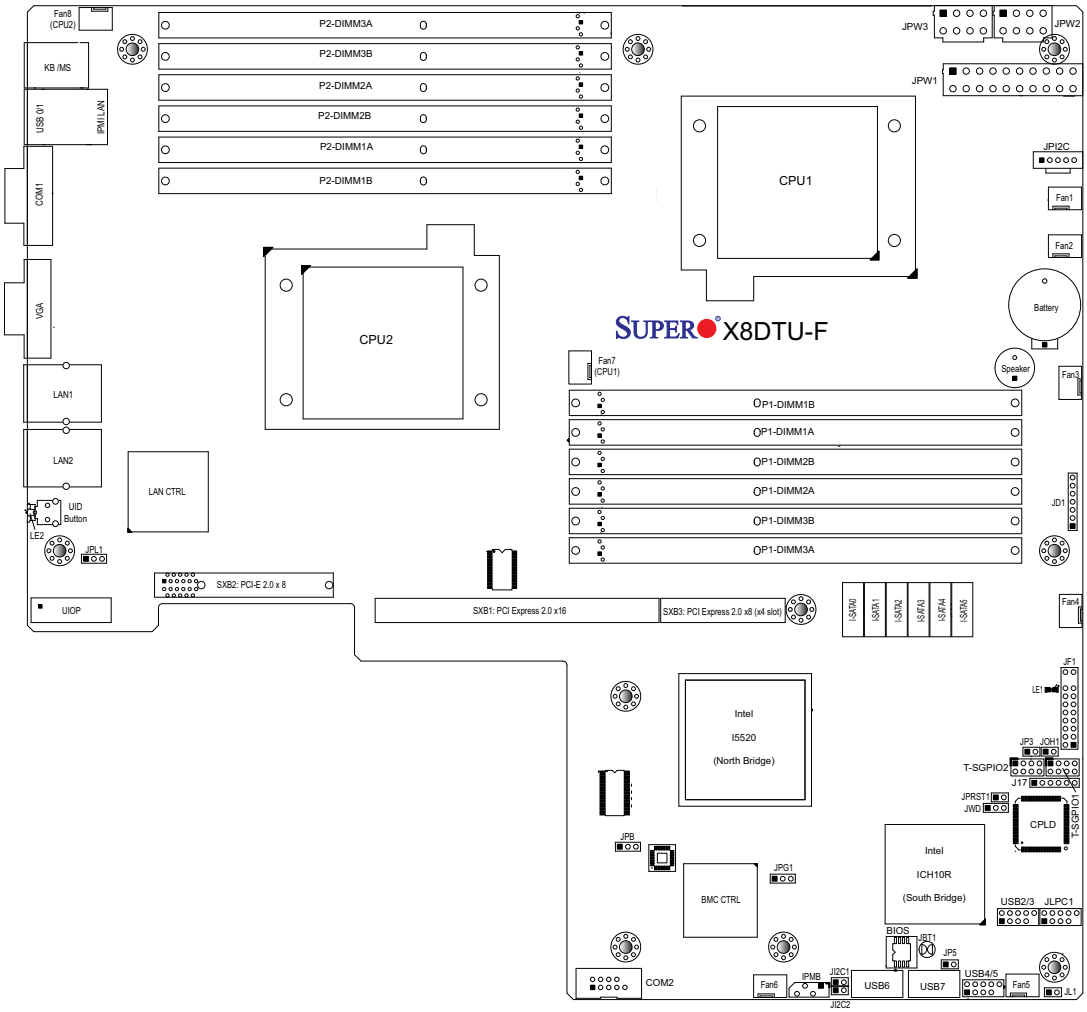
Before installing a PCI add-on card, make sure you install it into the correct riser card. Begin by releasing the locking tab that corresponds to the slot you wish to populate. Insert the expansion card into the correct riser card, pushing down with your thumbs evenly on both sides of the card.

PCI Slot/Card Configurations	
6016T-URF/6016T-UF	
Left Side Riser Card	**Expansion Card Supported**
RSC-R1UU-UE16 (pre-installed)	1x UIO card and 1x PCI-E x16 card
RSC-R1UU-E8PR (optional)	AOC-PG-i2+ for 2x LAN ports

PCI Slot/Card Configurations	
6016T-NTRF/6016T-NTF	
Left Side Riser Card	**Expansion Card Supported**
CSE-R1UU-2E8 (pre-installed)	2x PCI-E x8 cards
RSC-R1UU-E8PR (optional)	AOC-PG-i2+ for 2x LAN ports

5-7 Serverboard Details

Figure 5-4. SUPER X8DTU-F Layout
(not drawn to scale)



Notes:

Jumpers not indicated are for test purposes only.

When LE1 LED is on, the onboard power connection is on. Make sure to unplug the power cables before removing or installing components.

IPMI (Intelligent Platform Management Interface) 2.0 is supported by the X8DTU-F. For more information on IPMI configuration, refer to the Embedded BMC IPMI User Guide @http://www.supermicro.com/support/manuals/.

Warning

To provide adequate power to the add-on cards installed on the serverboard, please connect the UIOP PWR connector to the power supply for these cards to work properly.

X8DTU-F Quick Reference

Jumper	Description	Default Setting
JBT1	CMOS Clear	(See Section 5-9)
JI²C1/JI²C2	SMB to PCI-Exp. Slots	Open (Disabled)
JP3	ME Mode Select	Open (Normal)
JP5	ME Recovery	Open (Normal)
JPG1	VGA Enable/Disable	Pins 1-2 (Enabled)
JPL1	LAN1/2 Enable/Disable	Pins 1-2 (Enabled)
JPRST1	BMC/PHY Reset Enable/Disable	Open (Normal)
JWD1	Watch Dog	Pins 1-2 (Reset)

Connector	Description
COM1/COM2	Serial Port/Header
FAN 1-8	Chassis/CPU Fan Headers
Floppy	Floppy Disk Drive Connector
IPMB	IPMB I²C Header (for an IPMI Card)
I-SATA0 ~ I-SATA5	SATA Ports
JD1	Onboard Speaker/Power LED
JF1	Control Panel Connector
JL1	Chassis Intrusion Header
JOH1	Overheat Warning Header
JPI²C	Power Supply SMBus I²C Header
JPW1	20-Pin ATX Power Connector
JPW2/JPW3	8-pin Processor Power Connectors
LAN1/2	Gigabit Ethernet (RJ45) Ports
IPMI_LAN	IPMI 2.0 Dedicated LAN
T-SGPIO-1/T-SGPIO-2	Serial General Purpose Input/Output Headers
UIOP	UIO Card Power Supply Header
USB0/1, USB6, USB7	Universal Serial Bus (USB) Ports
USB2/3, USB4/5	Universal Serial Bus (USB) Headers

LED	Description
LE1	Onboard Standby PWR warning LED Indicator
LE2	Unit Identification (UID) LED

5-8 Connector Definitions

ATX Power Connector

The primary ATX power supply connector meets the SSI EPS 12V specification. Make sure that the orientation of the connector is correct. See the table on the right for pin definitions.

ATX Power 20-pin Connector Pin Definitions (JPW1)

Pin#	Definition	Pin #	Definition
11	PS On	1	Ground
12	5VSB	2	Ground
13	Ground	3	Ground
14	Ground	4	Ground
15	Ground	5	Ground
16	NC2	6	NC1
17	12V	7	12V
18	12V	8	12V
19	12V	9	12V
20	12V	10	12V

Processor Power Connectors

JPW2 and JPW3 must also be connected to the power supply to provide power for the processor(s). See the table on the right for pin definitions.

Processor Power Pin Definitions (JPW2/JPW3)

Pins	Definition
1 through 4	Ground
5 through 8	+12V

Warning: To prevent damage to your power supply or serverboard, please use a power supply that contains a 20-pin and two 8-pin power connectors. Be sure to connect these power connectors to the 20-pin and the two 8-pin power connectors on your serverboard for adequate power supply to your system. Failure to do so will void the manufacturer warranty on your power supply and serverboard.

NMI Button

The non-maskable interrupt button header is located on pins 19 and 20 of JF1. Refer to the table on the right for pin definitions.

NMI Button Pin Definitions (JF1)

Pin#	Definition
19	Control
20	Ground

Power LED

The Power LED connection is located on pins 15 and 16 of JF1. Refer to the table on the right for pin definitions.

Power LED Pin Definitions (JF1)

Pin#	Definition
15	Vcc
16	Control

HDD LED

The HDD (IDE Hard Disk Drive) LED connection is located on pins 13 and 14 of JF1. Attach the IDE hard drive LED cable to display disk activity. Refer to the table on the right for pin definitions.

HDD LED Pin Definitions (JF1)

Pin#	Definition
13	Vcc
14	HD Active

NIC1 LED

The NIC1 (Network Interface Controller) LED connection is located on pins 11 and 12 of JF1. Attach the NIC1 LED cable to display network activity. Refer to the table on the right for pin definitions.

NIC1 LED Pin Definitions (JF1)

Pin#	Definition
11	Vcc
12	Ground

NIC2 LED

The NIC2 (Network Interface Controller) LED connection is located on pins 9 and 10 of JF1. Attach the NIC2 LED cable to display network activity. Refer to the table on the right for pin definitions.

NIC2 LED Pin Definitions (JF1)

Pin#	Definition
9	Vcc
10	Ground

Overheat (OH)/Fan Fail/PWR Fail/ UID LED

Connect an LED to pins 7 and 8 of JF1 to provide advanced warning of chassis overheating or fan failure. These pins also work with the front UID indicator, which will activate as either a solid or flashing blue LED depending on whether the LED was activated via IPMI or the UID button. Refer to the tables on the right for pin definitions and status indicators.

Universal Info. LED Pin Definitions (JF1)

Pin#	Definition
7	Vcc
8	Control

Red LED Indications

State	Indication
Solid	Overheat
Blinking (fast)	Fan Fail
Blinking (slow)	Power Fail

Blue LED Indications

State	Indication
Solid	UID (via Button)
Blinking	UID (via IPMI)

Power Fail LED

The Power Fail LED connection is located on pins 5 and 6 of JF1. Refer to the table on the right for pin definitions.

Power Fail LED Pin Definitions (JF1)	
Pin#	Definition
5	Vcc
6	Ground

Reset Button

The Reset Button connection is located on pins 3 and 4 of JF1. Attach it to the hardware reset switch on the computer case. Refer to the table on the right for pin definitions.

Reset Button Pin Definitions (JF1)	
Pin#	Definition
3	Reset
4	Ground

Power Button

The Power Button connection is located on pins 1 and 2 of JF1. Momentarily contacting both pins will power on/off the system. This button can also be configured to function as a suspend button (see the Power Button Mode setting in BIOS). To turn off the power when set to suspend mode, depress the button for at least 4 seconds. Refer to the table on the right for pin definitions.

Power Button Pin Definitions (JF1)	
Pin#	Definition
1	PW_ON
2	Ground

Universal Serial Bus Ports

Two Universal Serial Bus ports are located on the I/O backplane. USB0 is the bottom connector and USB1 is the top connector. Two Type A ports (USB6 and USB7) are also included on the serverboard (see board layout for locations) See the table on the right for pin definitions.

Universal Serial Bus Ports Pin Definitions (USB0/1, USB6/7)	
Pin #	Definition
1	+5V
2	PO-
3	PO+
4	Ground
5	N/A

Universal Serial Bus Headers

Four additional USB headers (USB2/3 and USB4/5) are included on the serverboard. These may be used for front side access. A USB cable (not included) is needed for the connection. See the table on the right for pin definitions.

Universal Serial Bus Headers Pin Definitions (USB2/3, USB4/5)

USB2, USB4		USB3, USB5	
Pin #	Definition	Pin #	Definition
1	+5V	1	+5V
2	PO-	2	PO-
3	PO+	3	PO+
4	Ground	4	Ground
5	Key	5	NC

Serial Ports

The COM1 serial port is located on the IO backplane. COM2 is a header on the serverboard (see serverboard layout for location). See the table on the right for pin definitions.

Serial Port Pin Definitions (COM1, COM2)

Pin #	Definition	Pin #	Definition
1	DCD	6	DSR
2	RXD	7	RTS
3	TXD	8	CTS
4	DTR	9	RI
5	Ground	10	NC

Note: Pin 10 is included on the header but not on the port. NC indicates no connection.

Fan Headers

The X8DTU-F has eight headers, designated Fan1 through Fan8. FAN1 through FAN6 are for chassis/system fans while FAN7 and FAN8 are used to CPU heatsink fans. Their speed is controlled via Thermal Management with a BIOS setting. See the table on the right for pin definitions.

Fan Header Pin Definitions (FAN1-8)

Pin#	Definition
1	Ground (Black)
2	+12V (Red)
3	Tachometer
4	PWM Control

Chassis Intrusion

A Chassis Intrusion header is located at JL1. Attach the appropriate cable to inform you of a chassis intrusion.

Chassis Intrusion Pin Definitions (JL1)

Pin#	Definition
1	Intrusion Input
2	Ground

Power LED/Speaker

On the JD1 header, pins 1-3 are for a power LED and pins 4-7 are for an external speaker. See the table on the right for speaker pin definitions.

Note: The speaker connector pins are for use with an external speaker. If you wish to use the onboard speaker, you should close pins 6-7 with a jumper.

Speaker Connector Pin Definitions (JD1)

Pin #	Function	Definition
4	+	Speaker data (red wire)
5	Key	No connection
6		Key
7		Speaker data

ATX PS/2 Keyboard and PS/2 Mouse Ports

The ATX PS/2 keyboard and the PS/2 mouse ports are located beside the USB ports. See the table on the right for pin definitions.

PS/2 Keyboard and Mouse Ports Pin Definitions

Pin#	Definition
1	Data
2	NC
3	Ground
4	VCC
5	Clock
6	NC

Overheat LED

Connect an LED to the JOH1 header to provide warning of a chassis overheating condition. See the table on the right for pin definitions.

Overheat LED Pin Definitions (JOH1)

Pin#	Definition
1	+5V
2	OH Active

SGPIO

The two headers labeled T-SGPIO-1 and T-SGPIO-2 are for SGPIO (Serial General Purpose Input/Output). SGPIO supports serial link interfaces for onboard SATA and SAS ports. Connect the appropriate cables from the backplane to the SGPIO1 and SGPIO2 headers to utilize SATA/SAS management functions on your system.

SGPIO Headers Pin Definitions (T-SGPIO-1, T-SGPIO-2)

Pin#	Definition	Pin #	Definition
1	NC	2	NC
3	Ground	4	Data
5	Load	6	Ground
7	NC	8	NC

Note: NC indicates no connection.

Power SMB (I²C) Connector

The Power System Management Bus (I²C) header (JPI²C) is used to monitor the power supply, fan and system temperatures. See the table on the right for pin definitions.

PWR SMB Pin Definitions (JPI²C)

Pin#	Definition
1	Clock
2	Data
3	PWR Fail
4	Ground
5	+3.3V

IPMB I²C

A System Management Bus header for the IPMI slot is located at IPMB. Connect the appropriate cable here to use the IPMB I²C connection on your system.

IPMB I²C Pin Definitions (IPMB)

Pin#	Definition
1	Data
2	Ground
3	Clock
4	No Connection

UID Buttons

There are two Unit Identification (UID) buttons on the serverboard. The Front Panel UID Switch connects to pin 13 of JF1. The Rear UID Switch (SW1) is located next to LAN2. Pushing the UID switch on the Front Control Panel will illuminate both the Rear UID and the Control Panel UID indicators. Push the either switch again to turn off both indicators. These UID indicators provide easy identification of a system that may be in need of service.

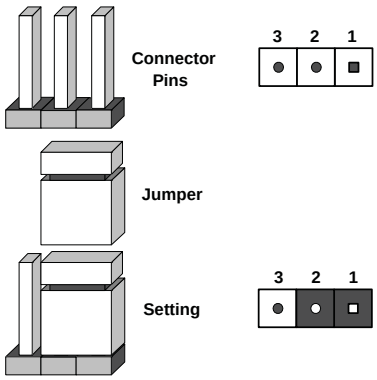
LAN1/2 (Ethernet Ports)

Two Ethernet ports (designated LAN1 and LAN2) are located beside the VGA port on the I/O backplane. These ports accept RJ45 type cables.

5-9 Jumper Settings

Explanation of Jumpers

To modify the operation of the serverboard, jumpers can be used to choose between optional settings. Jumpers create shorts between two pins to change the function of the connector. Pin 1 is identified with a square solder pad on the printed circuit board. See the diagram at right for an example of jumping pins 1 and 2. Refer to the serverboard layout page for jumper locations.



Note: On two-pin jumpers, "Closed" means the jumper is on and "Open" means the jumper is off the pins.

CMOS Clear

JBT1 is used to clear CMOS and will also clear any passwords. Instead of pins, this jumper consists of contact pads to prevent accidentally clearing the contents of CMOS.

To clear CMOS

1. First power down the system and unplug the power cord(s).
2. With the power disconnected, short the CMOS pads with a metal object such as a small screwdriver.
3. Remove the screwdriver (or shorting device).
4. Reconnect the power cord(s) and power on the system.

Note: *Do not use the PW_ON connector to clear CMOS.*

VGA Enable/Disable

JPG1 allows you to enable or disable the VGA port. The default position is on pins 1 and 2 to enable VGA. See the table on the right for jumper settings.

VGA Enable/Disable Jumper Settings (JPG1)	
Jumper Setting	Definition
Pins 1-2	Enabled
Pins 2-3	Disabled

LAN Enable/Disable

Change the setting of jumper JPL1 to enable or disable the onboard Ethernet (RJ45) ports LAN1 and LAN2. See the table on the right for jumper settings. The default setting is enabled.

LAN Enable/Disable Jumper Settings (JPL1)

Jumper Setting	Definition
Pins 1-2	Enabled
Pins 2-3	Disabled

Watch Dog Enable/Disable

JWD1 controls the Watch Dog function. Watch Dog is a system monitor that can reboot the system when a software application "hangs". Pins 1-2 will cause WD to reset the system if an application hangs. Pins 2-3 will generate a non-maskable interrupt signal for the application that has hung. See the table on the right for jumper settings. Watch Dog must also be enabled in BIOS.

Note: When enabled, the user needs to write their own application software to disable the Watch Dog Timer.

Watch Dog Jumper Settings (JWD1)

Jumper Setting	Definition
Pins 1-2	Reset
Pins 2-3	NMI
Open	Disabled

VGA Enable/Disable

JPG1 allows you to enable or disable the VGA port. The default position is on pins 1 and 2 to enable VGA. See the table on the right for jumper settings.

VGA Enable/Disable Jumper Settings (JPG1)

Jumper Setting	Definition
Pins 1-2	Enabled
Pins 2-3	Disabled

SMB to PCI Express Slots

Jumpers JI^{2}C1 and JI^{2}C2 allow you to connect the System Management Bus (I^{2}C) to the PCI Express slots. The default setting is Open to disable the connection. See the table on the right for jumper settings.

I^{2}C to PCI-Exp Jumper Settings (JI^{2}C1/2)

Jumper Setting	Definition
Closed	Enabled
Open	Disabled

BMC/PHY Reset

Jumper JPRST1 allow the user to reset the Winbond WPCM450 BMC (Baseboard Management Controller) chip and the PHY chip. The default is set to Open for normal operation. See the table on the right for jumper settings.

BMC/PHY Jumper Settings (JPRST1)	
Jumper Setting	Definition
Closed	Reset BMC & PHY
Open	Normall

Note: For more information on IPMI configuration instructions, please refer to the Embedded Winbond BMC IPMI user guide posted on our website:

http://www.supermicro.com/support/manuals/.

ME Mode Select

Closing jumper JP3 allows the user to bypass the SPI flash security and allow the manufacturer to flash the BIOS on the production line. See the table on the right for jumper settings.

ME Mode Select Jumper Settings (JP3)	
Jumper Setting	Definition
Open	Normal
Closed	Manufacture Mode

ME Recovery

Jumper JP5 allows the user to select the ME Firmware Recovery Mode for BIOS or firmware recovery. When in this mode, only essential system functions will be supported. This mode cannot be used for online BIOS upgrades. See the table on the right for jumper settings.

ME Recovery Select Jumper Settings (JP5)	
Jumper Setting	Definition
Open	Normal
Closed	ME Recovery

5-10 Onboard Indicators

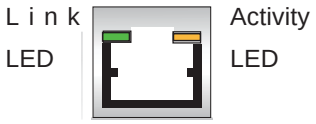
LAN1/LAN2 LEDs

The Ethernet ports (located beside the VGA port) have two LEDs. On each Gigabit LAN port, one LED indicates activity when blinking while the other LED may be green, amber or off to indicate the speed of the connection. See the table on the right for the functions associated with the connection speed LED.

LAN LED Connection Speed Indicator	
LED Color	Definition
Off	No connection or 10 Mb/s
Green	100 Mb/s
Amber	1 Gb/s

IPMI_Dedicated LAN LEDs

In addition to LAN1 and LAN2, the X8DTU-F has an IPMI_Dedicated LAN located on the IO backpanel. The amber LED indicates activity, while the Link LED may be green, amber or off to indicate the speed of the connection. See the tables at right for more information.



IPMI LAN Activity Indicator LED Settings		
Color	Status	Definition
Amber	Flashing	Active

IPMI LAN Indicator LED Settings	
LED Color	Definition
Off	No Connection or 10 Mb/s
Green	100 Mb/s
Amber	1 Gb/s

LE1

An Onboard Power LED is located at LE1 on the serverboard. When this LED is on, the system is on. Be sure to turn off the system and unplug the power cord before removing or installing components. See the tables at right for more information.

Onboard PWR LED Indicator (LE1) LED Settings	
LED Color	Definition
Off	System Off/Power cable not connected
Green	System On
Green: Flashing Quickly	ACPI S1 State
Green: Flashing Slowly	ACPI S3 State

LE2

The LE2 LED (located under SW1) is the UID indicator LED. LE2 illuminates when UID is initiated either by the UID button or via IPMI. If initiated a second time, LE2 will turn off.

When the LED blinks blue it means the signal was initiated via IPMI. If blue continuously it means the UID button initiated it.

5-11 SATA Port Connections

SATA Ports

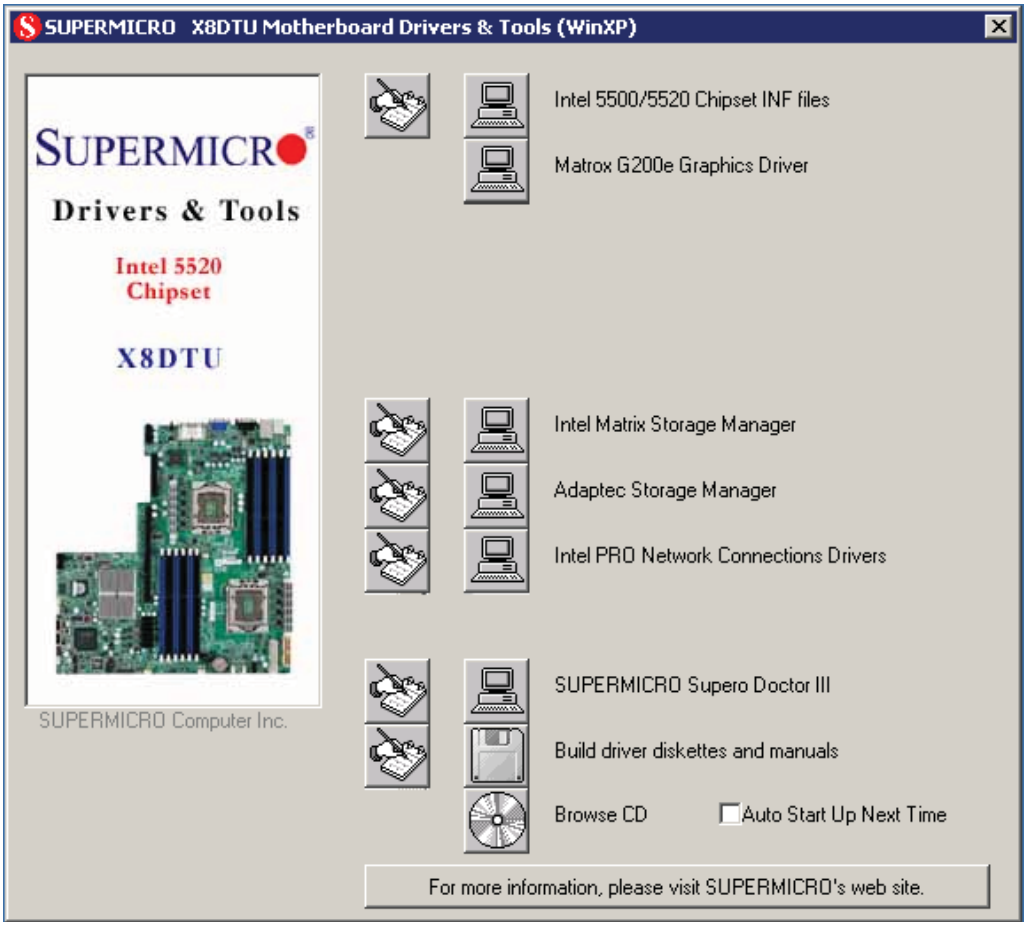
See the table on the right for pin definitions for the onboard SATA ports.

SATA Port Pin Definitions (I-SATA0 ~ I-SATA5)

Pin #	Definition
1	Ground
2	TXP
3	TXN
4	Ground
5	RXN
6	RXP
7	Ground

5-12 Installing Software

After the hardware has been installed, you should first install the operating system and then the drivers. The necessary drivers are all included on the Supermicro CDs that came packaged with your serverboard.



Driver/Tool Installation Display Screen

Note: Click the icons showing a hand writing on paper to view the readme files for each item. Click the computer icons to the right of these items to install each item (from top to the bottom) one at a time. **After installing each item, you must re-boot the system before moving on to the next item on the list.** The bottom icon with a CD on it allows you to view the entire contents of the CD.

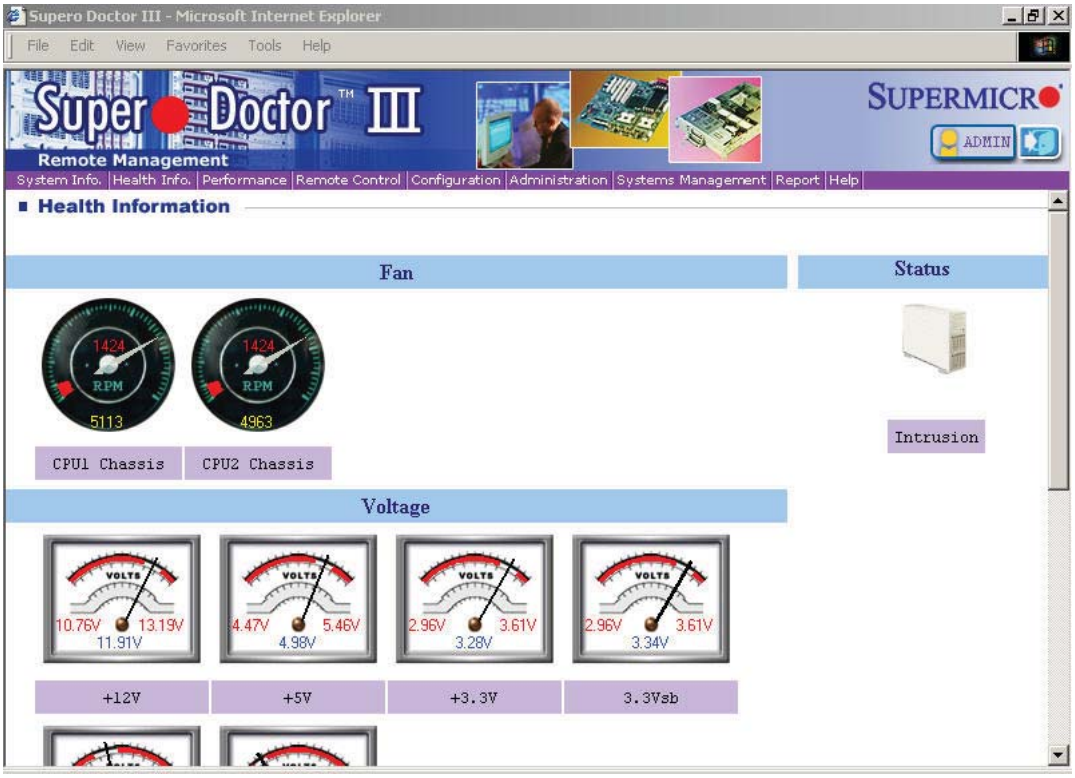
Supero Doctor III

The Supero Doctor III program is a Web base management tool that supports remote management capability. It includes Remote and Local Management tools. The local management is called SD III Client. The Supero Doctor III program included on the CDROM that came with your serverboard allows you to monitor the environment and operations of your system. Supero Doctor III displays crucial system information such as CPU temperature, system voltages and fan status. See the Figure below for a display of the Supero Doctor III interface.

Note: The default User Name and Password for SuperDoctor III is ADMIN / ADMIN.

Note: When SuperDoctor III is first installed, it adopts the temperature threshold settings that have been set in BIOS. Any subsequent changes to these thresholds must be made within Super Doctor, as the Super Doctor settings override the BIOS settings. To set the BIOS temperature threshold settings again, you would first need to uninstall SuperDoctor III.

Supero Doctor III Interface Display Screen (Health Information)



Supero Doctor III Interface Display Screen (Remote Control)

Supero Doctor III - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Super Doctor III
Remote Management
SUPERMICRO
ADMIN
System Info. Health Info. Performance Remote Control Configuration Administration Systems Management Report Help
Remote Control
Graceful Power Control
Open Console
Power Control
Enter
Comm.
Graceful power control
Supero Doctor III allows a user to inform the OS to reboot or shut down within a specified time (the default is 30 seconds). Before the system reboots or shuts down, it's allowed to cancel the action.
Requirements
Keep Supero SD3Service Daemon running at all times on this system.
Provide TCP/IP connectivity.
Power control

Note: SD III Software Revision 1.0 can be downloaded from our Web Site at: ftp://ftp.supermicro.com/utility/Supero_Doctor_III/. You can also download SDIII User's Guide at: http://www.supermicro.com/PRODUCT/Manuals/SDIII/UserGuide.pdf. For Linux, we will still recommend Supero Doctor II.

Chapter 6

Advanced Chassis Setup

This chapter covers the steps required to install components and perform maintenance on the SC815TQ-R650U/SC815TQ-560U chassis. For component installation, follow the steps in the order given to eliminate the most common problems encountered. If some steps are unnecessary, skip ahead to the next step.

Tools Required: The only tool you will need to install components and perform maintenance is a Philips screwdriver.

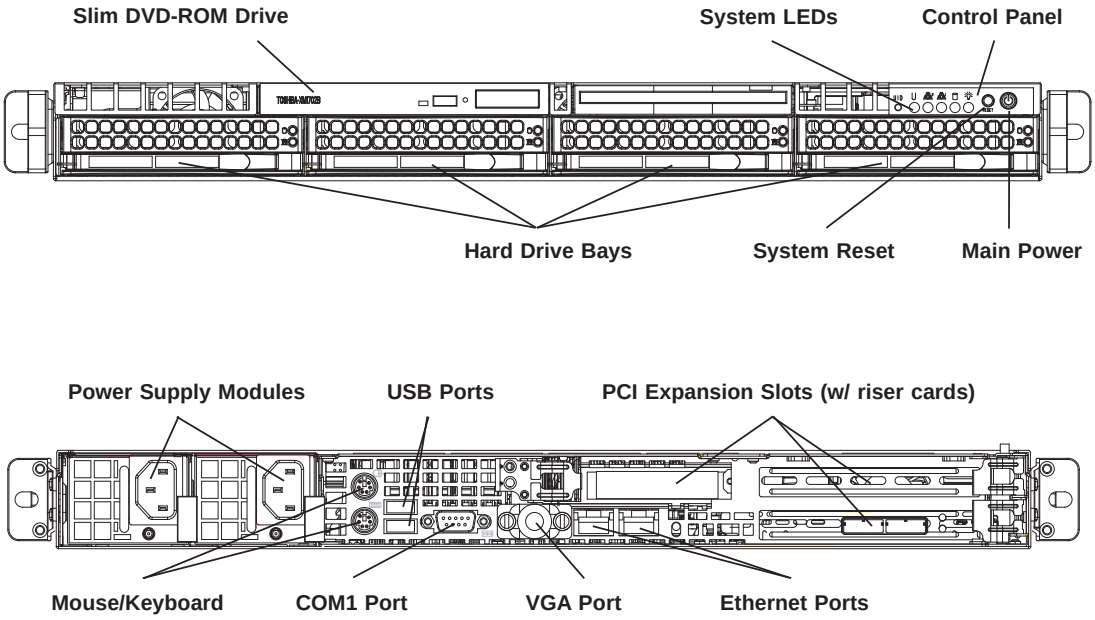
6-1 Static-Sensitive Devices

Electrostatic discharge (ESD) can damage electronic components. To prevent damage to any printed circuit boards (PCBs), it is important to handle them very carefully. The following measures are generally sufficient to protect your equipment from ESD damage.

Precautions

- Use a grounded wrist strap designed to prevent static discharge.
- Touch a grounded metal object before removing any board from its antistatic bag.
- Handle a board by its edges only; do not touch its components, peripheral chips, memory modules or gold contacts.
- When handling chips or modules, avoid touching their pins.
- Put the serverboard, add-on cards and peripherals back into their antistatic bags when not in use.
- For grounding purposes, make sure your computer chassis provides excellent conductivity between the power supply, the case, the mounting fasteners and the serverboard.

Figure 6-1. Chassis: Front and Rear Views



Note: the SC815TQ-560UBP chassis (6016T-UF/6016T-NTF) has only a single power supply module.

6-2 Control Panel

The control panel (located on the front of the chassis) must be connected to the JF1 connector on the serverboard to provide you with system status indications. These wires have been bundled together as a ribbon cable to simplify the connection.

Connect the cable from JF1 on the serverboard to the appropriate header on the Control Panel PCB (printed circuit board). Make sure the red wire plugs into pin 1 on both connectors. Pull all excess cabling out of the airflow path.

The control panel LEDs inform you of system status. See "Chapter 3: System Interface" for details on the LEDs and the control panel buttons. Details on JF1 can be found in "Chapter 5: Advanced Serverboard Setup."

6-3 System Fans

Four 4-cm heavy duty counter-rotating fans provide the cooling for the SuperServer 6016T-URF/6016T-UF/6016T-NTRF/6016T-NTF. Each fan unit is actually made up of two fans joined back-to-back, which rotate in opposite directions. This counter-rotating action generates exceptional airflow and works to dampen vibration levels. It is very important that the chassis top cover is properly installed and making a good seal in order for the cooling air to circulate properly through the chassis and cool the components. See Figure 6-2.

System Fan Failure

Fan speed is controlled by system temperature via a BIOS setting. If a fan fails, the remaining fan will ramp up to full speed and the overheat/fan fail LED on the control panel will turn on. Replace any failed fan at your earliest convenience with the same type and model (the system can continue to run with a failed fan).

Remove the top chassis cover while the system is still running to determine which of the two fans has failed. Then power down the system before replacing a fan. Removing the power cords is also recommended as a safety precaution.

Replacing System Fans

1. After determining which fan has failed, turn off the power to the system.

2. Unplug the fan cable from the serverboard and remove the failed fan from the chassis.

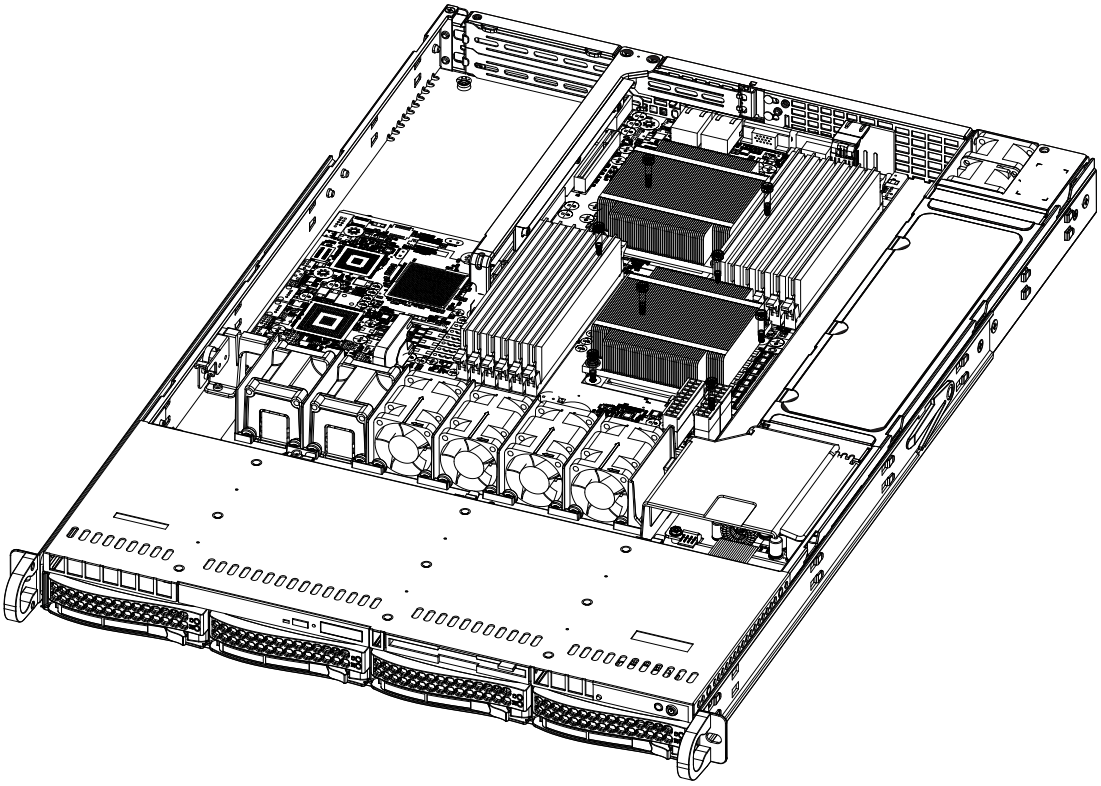
3. Replace the failed fan with an identical 4-cm, 12 volt fan (available from Supermicro: p/n FAN-0086L4).

4. Push the new fan into the vacant space in the housing while making sure the arrows on the top of the fan (indicating air direction) point in the same direction as the arrows on the other fans.

5. Reposition the fan housing back over the two mounting posts in the chassis, then reconnect the fan wires to the same chassis fan headers you removed them from.

6. Power up the system and check that the fan is working properly and that the LED on the control panel has turned off. Finish by replacing the chassis cover.

Figure 6-2. System Cooling Fans

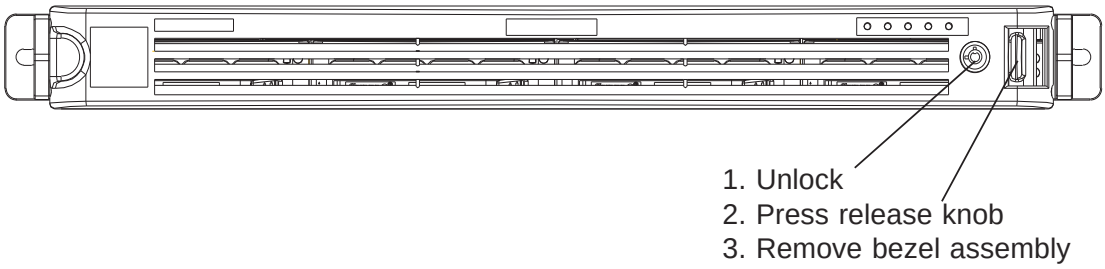


6-4 Drive Bay Installation/Removal

Removing the Front Bezel

If your system has a front bezel (optional) attached to the chassis, you must first remove it to gain access to the drive bays. To remove the bezel, first unlock the front of the chassis then press the release knob (see Figure 6-3). Carefully remove the bezel with both hands. A filter located within the bezel can be removed for replacement/cleaning. It is recommended that you keep a maintenance log of filter cleaning/replacement, since its condition will affect the airflow throughout the whole system.

Figure 6-3. Removing the Front Bezel



Accessing the Drive Bays

Hard Drives: Because of their hotswap capability, you do not need to access the inside of the chassis or power down the system to install or replace SATA drives. Proceed to the next section for instructions.

DVD-ROM Drive: For installing/removing a DVD-ROM drive, you will need to gain access to the inside of the 6016T-URF/6016T-UF/6016T-NTRF/6016T-NTF by removing the top cover of the chassis. Proceed to the "DVD-ROM Drive Installation" section later in this chapter for instructions.

Note: Only a "slim" DVD-ROM drive will fit into the 6016T-URF/6016T-UF/6016T-NTRF/6016T-NTF.

Hard Drive Installation

The hard drives are mounted in drive carriers to simplify their installation and removal from the chassis. These carriers also help promote proper airflow for the drive bays. For this reason, even empty carriers without drives installed must remain in the chassis.

Mounting a Hard Drive in a Drive Carrier

1. Insert a drive into the carrier with the printed circuit board side facing down so that the mounting holes align with those in the carrier.

2. Secure the drive to the carrier with six screws, as shown in Figure 6-4.

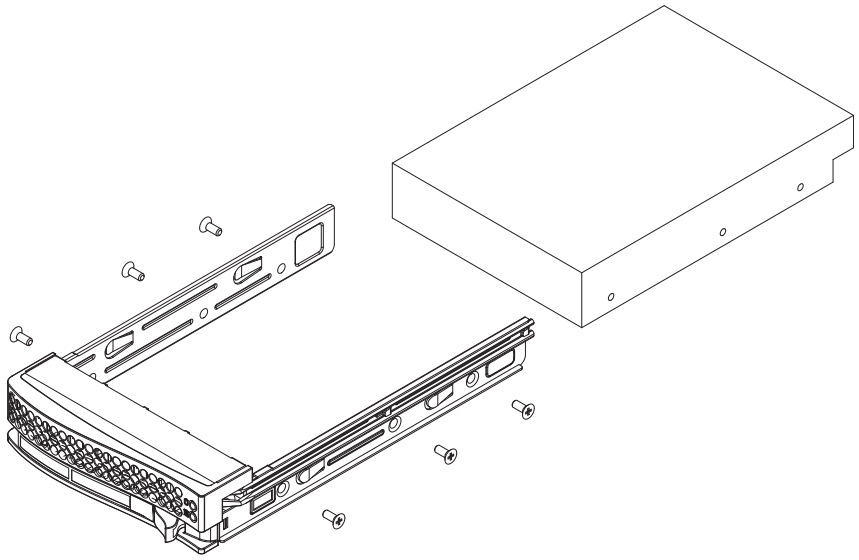


Figure 6-4. Mounting a Hard Drive in a Carrier

Use caution when working around the hard drive backplane. Do not touch the backplane with any metal objects and make sure no ribbon cables touch the backplane or obstruct the holes, which aid in proper airflow.

<u>Important:</u> Regardless of how many hard drives are installed, all drive carriers must remain in the drive bays to maintain proper airflow.

Installing/Removing a Hard Drive

1. To remove a carrier, push the release button located beside the drive LEDs.

2. Swing the colored handle fully out and use it to pull the unit straight out (see Figure 6-5).

Note: Your operating system must have RAID support to enable the hot-plug capability of the hard drives.

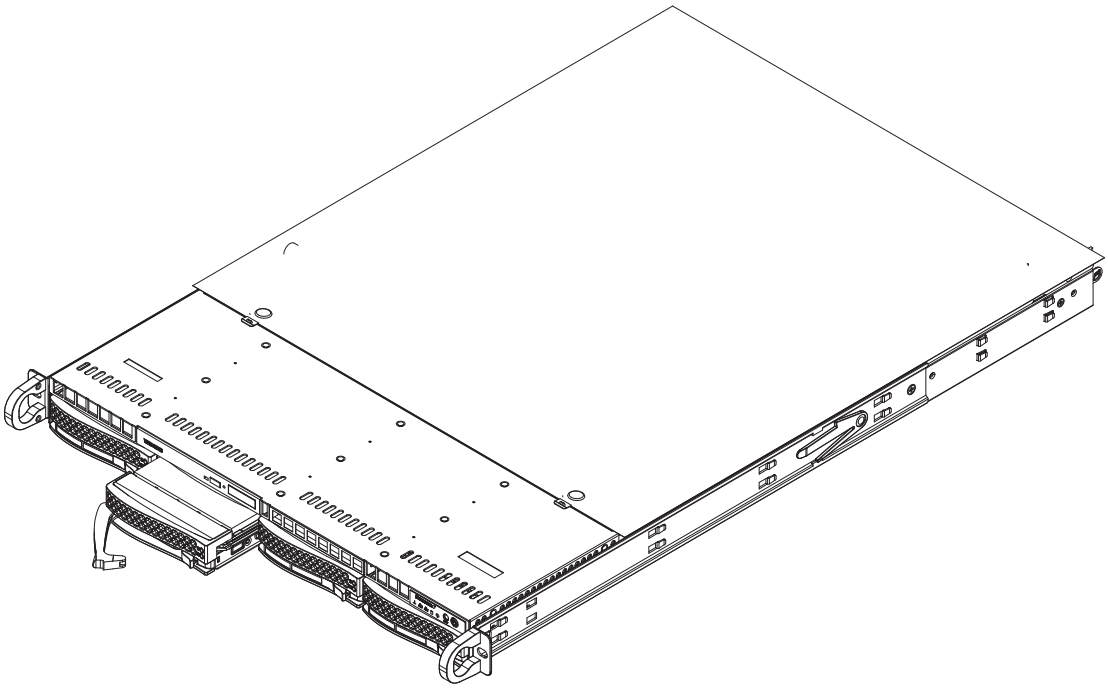


Figure 6-5. Removing a Hard Drive from the Server

DVD-ROM Drive Installation

The top cover of the chassis must be opened to gain full access to the DVD-ROM drive bay. The 6016T-URF/6016T-UF/6016T-NTRF/6016T-NTF accomodates only slim-line DVD-ROM drives. Side mounting brackets are needed to mount a slim-line DVD-ROM drive in the 6016T-URF/6016T-UF/6016T-NTRF/6016T-NTF server. You must power down the system before installing or removing a DVD-ROM drive.

Removing the Chassis Cover

1. Grasp the two handles on either side and pull the unit straight out until it locks (you will hear a "click").

2. Depress the two buttons on the top of the chassis to release the top cover and at the same time, push the cover away from you until it stops. You can then lift the top cover from the chassis to gain full access to the inside of the server.

Removing/Installing a Drive

1. With the chassis cover removed, unplug the power and data cables from the drive you want to remove.

2. Locate the locking tab at the rear of the drive. It will be on the left side of the drive when viewed from the front of the chassis.

3. Pull the tab away from the drive and push the drive unit out the front of the chassis.

4. Add a new drive by following this procedure in reverse order. You may hear a faint *click* of the locking tab when the drive is fully inserted.

5. Remember to reconnect the data and power cables to the drive before replacing the chassis cover and restoring power to the system.

6-5 Power Supply

6016T-URF/6016T-NTRF

The SuperServer 6016T-URF/6016T-NTRF has a 650 watt redundant power supply configuration consisting of two hot-swap power modules. The power supply modules have an auto-switching capability, which enables them to automatically sense and operate with a 100V - 240V input voltage.

Power Supply Failure

If either of the two power supply modules fail, the other module will take the full load and allow the system to continue operation without interruption. The Universal Information LED on the control panel will blink slowly and remain so until the failed module has been replaced. Replacement modules can be ordered directly from Supermicro (see contact information in the Preface). The power supply modules have a hot-swap capability, meaning you can replace the failed module without powering down the system.

Replacing the Power Supply

You do not need to shut down the system to replace a power supply module. The redundant feature will keep the system up and running while you replace the failed hot-swap module. Replace with the same model, which can be ordered directly from Supermicro (see Contact Information in the Preface).

1. First unplug the power cord from the failed power supply module.

2. To remove the failed power module, push the release tab (on the back of the power supply) to the side and then pull the module straight out (see Figure 6-6).

3. The power supply wiring was designed to detach automatically when the module is pulled from the chassis.

4. Replace the failed power module with another PWS-651-1R power supply module.

5. Simply push the new power supply module into the power bay until you hear a click.

6. Finish by plugging the AC power cord back into the module.

6016T-UF/6016T-NTF

The SuperServer 6016T-UF/6016T-NTF has a single 560 watt power supply, which is auto-switching capable. This enables it to automatically sense and operate with a 100v - 240v input voltage.

Power Supply Failure

If the power supply module fails, the system will shut down and you will need to replace the module. Replacements can be ordered directly from Supermicro (see contact information in the Preface). As there is only one power supply module in the 6016T-UF/6016T-NTF, power must be completely removed from the server before removing and replacing the power supply for whatever reason.

Replacing the Power Supply

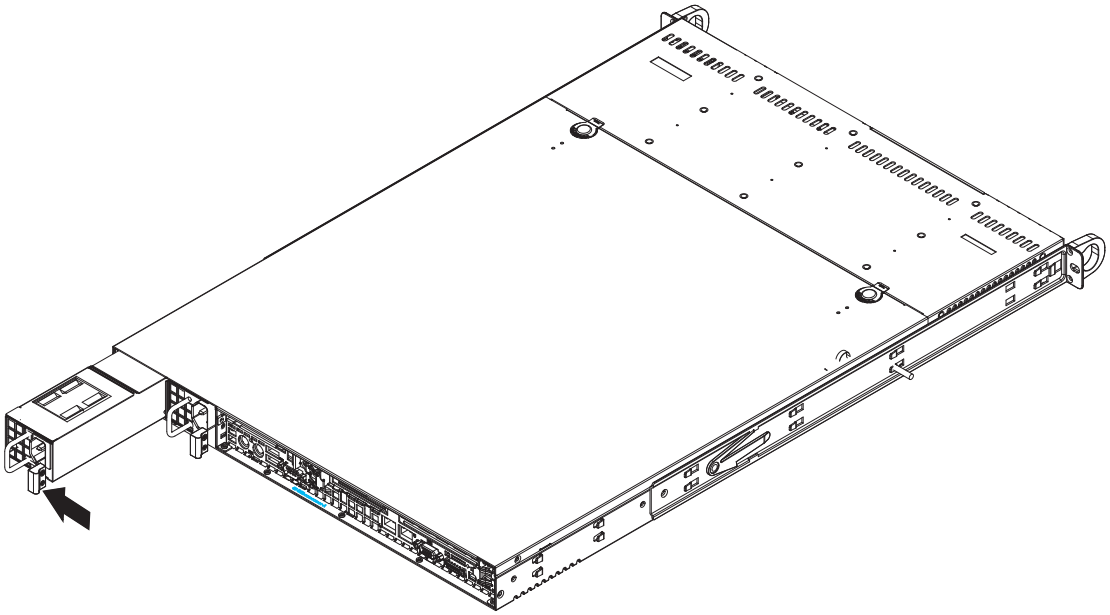
First turn the power switch on the control panel off, then unplug the power cord from the system. Replace with the same model (p/n PWS-561-1H20), which can be ordered directly from Supermicro (see Contact Information in the Preface).

1. Remove the screws that secure the power supply to the chassis then pull the module straight out with the handle provided (see Figure 6-6, redundant power supply server shown). The power supply wiring was designed to detach automatically when the module is pulled from the chassis.

2. Carefully insert the new power supply into the open bay and push it completely into the chassis until you hear a clicking sound, meaning it has been fully inserted.

3. Secure it to the chassis with the screw you removed previously, then reconnect the AC power cord and depress the power button on the control panel to restart the system.

Figure 6-6. Removing/Replacing the Power Supply



Notes

Chapter 7

BIOS

7-1 Introduction

This chapter describes the AMI BIOS Setup Utility for the X8DTU-F. The AMI ROM BIOS is stored in a Flash EEPROM and can be easily updated. This chapter describes the basic navigation of the AMI BIOS Setup Utility setup screens.

Starting BIOS Setup Utility

To enter the AMI BIOS Setup Utility screens, press the <Delete> key while the system is booting up.

Note: In most cases, the <Delete> key is used to invoke the AMI BIOS setup screen. There are a few cases when other keys are used, such as <F1>, <F2>, etc.

Each main BIOS menu option is described in this manual. The Main BIOS setup menu screen has two main frames. The left frame displays all the options that can be configured. Grayed-out options cannot be configured. Options in blue can be configured by the user. The right frame displays the key legend. Above the key legend is an area reserved for a text message. When an option is selected in the left frame, it is highlighted in white. Often a text message will accompany it. (**Note**: the AMI BIOS has default text messages built in. Supermicro retains the option to include, omit, or change any of these text messages.)

The AMI BIOS Setup Utility uses a key-based navigation system called "hot keys". Most of the AMI BIOS setup utility "hot keys" can be used at any time during the setup navigation process. These keys include <F1>, <F10>, <Enter>, <ESC>, arrow keys, etc.

Note: Options printed in **Bold** are default settings.

How To Change the Configuration Data

The configuration data that determines the system parameters may be changed by entering the AMI BIOS Setup utility. This Setup utility can be accessed by pressing <Del> at the appropriate time during system boot.

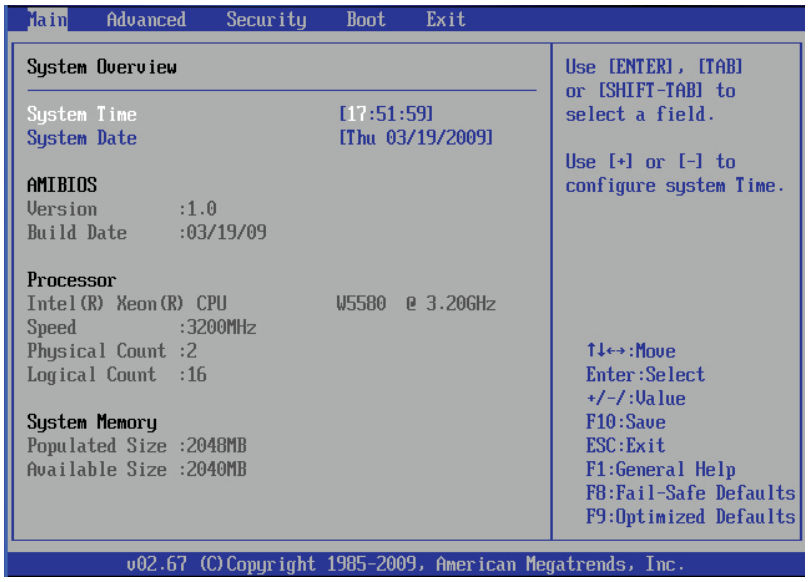
Starting the Setup Utility

Normally, the only visible Power-On Self-Test (POST) routine is the memory test. As the memory is being tested, press the <Delete> key to enter the main menu of the AMI BIOS Setup Utility. From the main menu, you can access the other setup screens. An AMI BIOS identification string is displayed at the left bottom corner of the screen below the copyright message.

Warning! Do not upgrade the BIOS unless your system has a BIOS-related issue. Flashing the wrong BIOS can cause irreparable damage to the system. In no event shall Supermicro be liable for direct, indirect, special, incidental, or consequential damages arising from a BIOS update. If you have to update the BIOS, do not shut down or reset the system while the BIOS is updating. This is to avoid possible boot failure.

7-2 Main Setup

When you first enter the AMI BIOS Setup Utility, you will enter the Main setup screen. You can always return to the Main setup screen by selecting the Main tab on the top of the screen. The Main BIOS Setup screen is shown below.



System Overview: The following BIOS information will be displayed:

System Time/System Date

Use this option to change the system time and date. Highlight *System Time* or *System Date* using the arrow keys. Key in new values through the keyboard and press <Enter>. Press the <Tab> key to move between fields. The date must be entered in Day MM/DD/YY format. The time is entered in HH:MM:SS format. (**Note:** The time is in the 24-hour format. For example, 5:30 P.M. appears as 17:30:00.)

AMI BIOS

- **Version**: This item displays the BIOS revision used in your system.
- **Build Date**: This item displays the date when this BIOS was complete.

Processor

The AMI BIOS will automatically display the status of the processor used in your system:

- **CPU Type**: This item displays the type of CPU used in the serverboard.
- **Speed**: This item displays the speed of the CPU detected by the BIOS.
- **Physical Count**: This item displays the number of processors installed in your system as detected by the BIOS.
- **Logical Count**: This item displays the number of CPU Cores installed in your system as detected by the BIOS.

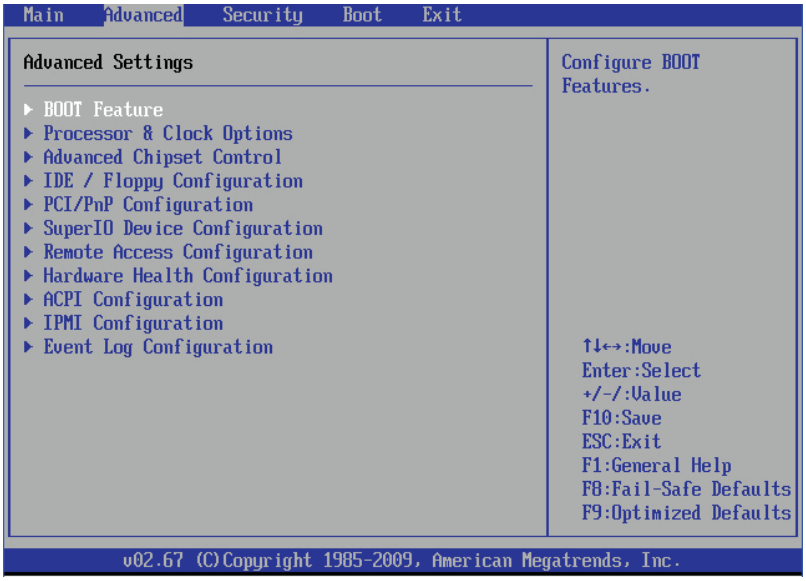
System Memory

This displays the size of memory available in the system:

- **Populated Size**: This item displays the populated memory size detected by the BIOS.
- **Available Size**: This item displays the memory size that is available for use.

7-3 Advanced Setup Configurations

Use the arrow keys to select Boot Setup and hit <Enter> to access the submenu items:



▶BOOT Features

Quick Boot

If Enabled, this option will skip certain tests during POST to reduce the time needed for system boot. The options are **Enabled** and Disabled.

Quiet Boot

This option allows the bootup screen options to be modified between POST messages or the OEM logo. Select Disabled to display the POST messages. Select Enabled to display the OEM logo instead of the normal POST messages. The options are **Enabled** and Disabled.

AddOn ROM Display Mode

This sets the display mode for Option ROM. The options are **Force BIOS** and Keep Current.

Bootup Num-Lock

This feature selects the Power-on state for Numlock key. The options are Off and **On**.

PS/2 Mouse Support

Select Enabled to enable PS/2 Mouse support. Select **Auto** to enable the onboard PS/2 mouse when a PS/2 mouse is detected. The options are Enable, Disabled, and **Auto**.

Wait For 'F1' If Error

This forces the system to wait until the 'F1' key is pressed if an error occurs. The options are Disabled and **Enabled**.

Hit 'Del' Message Display

This feature displays "Press DEL to run Setup" during POST. The options are **Enabled** and Disabled.

Watch Dog Function

If enabled, the Watch Dog Timer will allow the system to reboot when it is inactive for more than 5 minutes. The options are Enabled and **Disabled.**

Restore on AC Power Loss

Use this feature to set the power state after a power outage. Select Power-Off for the system power to remain off after a power loss. Select Power-On for the system power to be turned on after a power loss. Select Last State to allow the system to resume its last state before a power loss. The options are Power-On, Power-Off and **Last State**.

Interrupt 19 Capture

Interrupt 19 is the software interrupt that handles the boot disk function. When this item is set to Enabled, the ROM BIOS of the host adaptors will "capture" Interrupt 19 at boot and allow the drives that are attached to these host adaptors to function as bootable disks. If this item is set to Disabled, the ROM BIOS of the host adaptors will not capture Interrupt 19, and the drives attached to these adaptors will not function as bootable devices. The options are **Enabled** and Disabled.

▶Processor and Clock Options

This submenu allows the user to configure the Processor and Clock settings.

CPU Ratio

Select Manual to manually configure the CPU Ratio. Select Auto to allow the BIOS to automatically configure the CPU Ratio. The options are **Auto** and Manual.

Clock Spread Spectrum

Select Enable to use the feature of Clock Spectrum, which will allow the BIOS to monitor and attempt to reduce the level of Electromagnetic Interference caused by the components whenever needed. The options are **Disabled** and Enabled.

Hardware Prefetcher (Available when supported by the CPU)

If set to Enabled, the hardware pre fetcher will pre fetch streams of data and instructions from the main memory to the L2 cache in the forward or backward manner to improve CPU performance. The options are Disabled and **Enabled**.

Adjacent Cache Line Prefetch (Available when supported by the CPU)

The CPU fetches the cache line for 64 bytes if this option is set to Disabled. The CPU fetches both cache lines for 128 bytes as comprised if **Enabled**.

Intel® Virtualization Technology (Available when supported by the CPU)

Select Enabled to use the feature of Virtualization Technology to allow one platform to run multiple operating systems and applications in independent partitions, creating multiple "virtual" systems in one physical computer. The options are Enabled and **Disabled**. **Note**: If there is any change to this setting, you will need to power off and restart the system for the change to take effect. Please refer to Intel's web site for detailed information.

Execute-Disable Bit Capability (Available when supported by the OS and the CPU)

Set to Enabled to enable the Execute Disable Bit which will allow the processor to designate areas in the system memory where an application code can execute and where it cannot, thus preventing a worm or a virus from flooding illegal codes to overwhelm the processor or damage the system during an attack. The default is **Enabled**. (Refer to Intel and Microsoft Web Sites for more information.)

Simultaneous Multi-Threading (Available when supported by the CPU)

Set to Enabled to use the Simultaneous Multi-Threading Technology, which will result in increased CPU performance. The options are Disabled and **Enabled.**

Active Processor Cores

Set to Enabled to use a processor's Second Core and beyond. (Please refer to Intel's web site for more information.) The options are **All,** 1 and 2.

Intel® EIST Technology

EIST (Enhanced Intel SpeedStep Technology) allows the system to automatically adjust processor voltage and core frequency in an effort to reduce power consumption and heat dissipation. **Please refer to Intel's web site for detailed information.** The options are Disable (Disable GV3) and **Enable (Enable GV3)**.

Intel® TurboMode Technology

Select Enabled to use the Turbo Mode to boost system performance. The options are **Enabled** and Disabled.

C1E Support

Select Enabled to use the feature of Enhanced Halt State. C1E significantly reduces the CPU's power consumption by reducing the CPU's clock cycle and voltage during a "Halt State." The options are Disabled and **Enabled**.

Intel® C-STATE Tech

If enabled, C-State is set by the system automatically to either C2, C3 or C4 state. The options are Disabled and **Enabled**.

C-State package limit setting

If set to Auto, the AMI BIOS will automatically set the limit on the C-State package register. The options are **Auto**, C1, C3, C6 and C7.

C1 Auto Demotion

When enabled, the CPU will conditionally demote C3, C6 or C7 requests to C1 based on un-core auto-demote information. The options are Disabled and **Enabled.**

C3 Auto Demotion

When enabled, the CPU will conditionally demote C6 or C7 requests to C3 based on un-core auto-demote information. The options are Disabled and **Enabled.**

DCA Technology

Select Enabled to use Intel's DCA (Direct Cache Access) Technology to enhance data transfer efficiency. The options are **Enabled** and Disabled.

DCA Prefetch Delay

A DCA Prefetch is used with TOE components to prefetch data in order to shorten execution cycles and maximize data processing efficiency. Prefetching too frequently can saturate the cache directory and delay necessary cache accesses. This feature reduces or increases the frequency the system prefetches data. The options are [8], [16], **[32]**, [40], [48], [56], [64], [72], [80], [88], [96], [104], [112], [120]

▶Advanced Chipset Control

The items included in the Advanced Settings submenu are listed below:

▶QPI & IMC Configuration

QuickPath Interconnect (QPI) is the connection between the CPU and the serverboard's I/O hub. Use this feature to modify speed and power management settings.

QPI Links Speed

This feature selects QPI's data transfer speed. The options are Slow-mode, and **Full Speed**.

QPI Frequency

This selects the desired QPI frequency. The options are **Auto**, 4.800 GT, 5.866GT, 6.400 GT.

QPI L0s and L1

This enables the QPI power state to low power. L0s and L1 are automatically selected by the serverboard. The options are **Disabled** and Enabled.

Memory Frequency

This feature forces a DDR3 frequency slower than what the system has detected. The available options are **Auto**, Force DDR-800, Force DDR-1066, and Force DDR-1333.

Memory Mode

The options are **Independent**, Channel Mirror, Lockstep and Sparing.

Independent - All DIMMs are available to the operating system.

Channel Mirror - The serverboard maintains two identical copies of all data in memory for redundancy.

Lockstep - The serverboard uses two areas of memory to run the same set of operations in parallel.

Sparing - A preset threshold of correctable errors is used to trigger fail-over. The spare memory is put online and used as active memory in place of the failed memory.

Demand Scrubbing

A memory error-correction scheme where the Processor writes corrected data back into the memory block from where it was read by the Processor. The options are **Enabled** and Disabled.

Patrol Scrubbing

A memory error-correction scheme that works in the background looking for and correcting resident errors. The options are **Enabled** and Disabled.

Throttling - Closed Loop/Throttling - Open Loop

Throttling improves reliability and reduces power in the processor by automatic voltage control during processor idle states. Available options are **Disabled** and Enabled. If Enabled, the following items will appear:

Hysteresis Temperature (This feature is available when Closed Loop is enabled.)

Temperature Hysteresis is the temperature lag (in degrees Celsius) after the set DIMM temperature threshold is reached before Closed Loop Throttling begins. The options are **Disabled**, 1.5^{o}C, 3.0^{o}C, and 6.0^{o}C.

Guardband Temperature (This feature is available when Closed Loop is enabled.)

This is the temperature which applies to the DIMM temperature threshold. Each step is in 0.5^{o}C increment. The default is **[006]**. Press "+" or "-" on your keyboard to change this value.

Inlet Temperature

This is the temperature detected at the chassis inlet. Each step is in 0.5^{o}C increment. The default is **[070]**. Press "+" or "-" on your keyboard to change this value.

Temperature Rise

This is the temperature rise to the DIMM thermal zone. Each step is in 0.5^{o}C increment. The default is **[020]**. Press "+" or "-" on your keyboard to change this value.

Air Flow

This is the air flow speed to the DIMM modules. Each step is one mm/sec. The default is **[1500]**. Press "+" or "-" on your keyboard to change this value.

Altitude

This feature defines how many meters above or below sea level the system is located. The options are **Sea Level or Below,** 1~300, 301~600, 601~900, 901~1200, 1201~1500, 1501~1800, 1801~2100, 2101~2400, 2401~2700, 2701~3000.

DIMM Pitch

This is the physical space between each DIMM module. Each step is in 1/1000 of an inch. The default is **[400]**. Press "+" or "-" on your keyboard to change this value.

Intel VT-d

Select Enabled to enable Intel's Virtualization Technology support for Direct I/O VT-d by reporting the I/O device assignments to VMM through the DMAR ACPI Tables. This feature offers fully-protected I/O resource-sharing across the Intel platforms,

providing the user with greater reliability, security and availability in networking and data-sharing. The options are Enabled and **Disabled**.

SR-IOV Supported

Select Enabled to enable Single Root I/O Virtualization (SR-IOV) support which works in conjunction with the Intel Virtualization Technology and allow multiple operating systems running simultaneously within a single computer via natively share PCI-Express devices in order to enhance network connectivity and performance. The options are Enabled and **Disabled**.

NUMA Support

Select Enabled to use the feature of Non-Uniform Memory Access to improve CPU performance. The options are Enabled and **Disabled**.

Intel I/OAT

The Intel I/OAT (I/O Acceleration Technology) significantly reduces CPU overhead by leveraging CPU architectural improvements, freeing resources for more other tasks. The options are Disabled and Enabled.

Slot SXB2/SXB3 Width

This feature allows the user to change the link width of a PCI slot as specified in order to support a riser or add-on card installed in the slot. The options are x4x4x4x4, **x4x4x8**, x8x4x4, x8x8, and x16 as shown in the table below.

Options:	SXB2/	SXB3
x4x4x4x4:	x4x4/	x4x4
x4x4x8:	x4x4/	x8
x8x4x4:	x8/	x4x4
x8x8:	x8/	x8
x16:	x16	

Slot SXB1 Width

This feature allows the user to change the link width of a PCI slot as specified in order to support a riser or add-on card installed in the slot. The options are x4x4x4x4, x4x4x8, x8x4x4, **x8x8,** and x16.

Active State Power Management

Select Enabled to use the power management for signal transactions between the PCI Express L0 and L1 Links. Select Enabled to configure PCI-Exp. L0 and L1 Link power states. The options are **Disabled** and Enabled.

USB Functions

This feature allows the user to decide the number of onboard USB ports to be enabled. The Options are: Disabled, 2 USB ports, 4 USB ports, 6 USB ports, 8 Ports, 10 Ports and **12 USB ports**.

USB 2.0 Controller

This item indicates if the onboard USB 2.0 controller is activated. The default setting is Enabled.

Legacy USB Support

Select Enabled to use Legacy USB devices. If this item is set to Auto, Legacy USB support will be automatically enabled if a legacy USB device is installed on the serverboard, and vise versa. The settings are Disabled, Enabled and **Auto**.

BIOS EHCI Hand-Off

Select Enabled to enable BIOS Enhanced Host Controller Interface support to provide a workaround solution for an operating system that does not have EHCI Hand-Off support. When enabled, the EHCI Interface will be changed from the BIOS-controlled to the OS-controlled. The options are Disabled and **Enabled**.

▶IDE/Floppy Configuration

When this submenu is selected, the AMI BIOS automatically detects the presence of the IDE or Floppy devices and displays the following items:

SATA#1 Configuration

If Compatible is selected, it sets SATA#1 to legacy compatibility mode, while selecting Enhanced sets SATA#1 to native SATA mode. The options are Disabled, Compatible and **Enhanced**.

Configure SATA#1 as

This feature allows the user to select the drive type for SATA#1. The options are **IDE,** RAID and AHCI. (When the option-RAID is selected, the item-ICH RAID Code Base will appear. When the option-AHCI is selected, the item-SATA AHCI will be available.)

SATA#2 Configuration (Available when the option-IDE is selected.)

Selecting Enhanced will set SATA#2 to native SATA mode. The options are Disabled, and **Enhanced**.

ICH RAID Code Base (Available when the option-RAID is selected.)

Select Intel to enable Intel's SATA RAID firmware to configure Intel's SATA RAID settings. Select Adaptec to enable Adaptec's SATA RAID firmware to configure Adaptec's SATA RAID settings. The options are **Intel** and Adaptec.

SATA AHCI (Available when the option-AHCI is selected.)

Select Enable to enable the function of Serial ATA Advanced Host Interface. (Take caution when using this function. This feature is for advanced programmers only.)

IDE Detect Timeout (sec)

Use this feature to set the time-out value for the BIOS to detect the ATA, ATAPI devices installed in the system. The options are 0 (sec), 5, 10, 15, 20, 25, 30, and **35**.

▶PCI/PnP Configuration

Clear NVRAM

This feature clears the NVRAM during system boot. The options are **No** and Yes.

Plug & Play OS

Selecting Yes allows the OS to configure Plug & Play devices. (This is not required for system boot if your system has an OS that supports Plug & Play.) Select **No** to allow the AMI BIOS to configure all devices in the system.

PCI Latency Timer

This feature sets the latency Timer of each PCI device installed on a PCI bus. Select 64 to set the PCI latency to 64 PCI clock cycles. The options are 32, **64**, 96, 128, 160, 192, 224 and 248.

PCI IDE BusMaster

When enabled, the BIOS uses PCI bus mastering for reading/writing to IDE drives. The options are Disabled and **Enabled.**

PCIe IO Performance

This feature allows the user to configure PCI-E slot settings to enhance performance. The default setting is **128MB.**

PCI SERR Function

PCI SERR (System Error) is for reporting address parity errors, or any other fatal system errors. It is shared among all PCI devices. The options are **Disabled** and Enabled.

PCI SERR Signal Type (Available when PCI SERR Function is enabled.)

System Monitoring Interface (SMI) and Non-Maskable Interrupt (NMI) are different signal interfaces in the serverboard that handles system errors. The options are [NMI], and **[SMI]**.

PCI-E Slot from SXB1/PCI-E Slot from SXB2/PCI-E Slot from SXB3

Select Enabled to enable PCI-E SXB1 slot, PCI-E SXB2 slot or PCI-E SXB3 slot. It can also enable Option ROMs to boot computer using a network interface from these slots. (SXB1, a x16 slot, can be configured into two x8 slots. SXB2, a x8 slot, can be configured into two x4 slots.) The options are Enabled and **Disabled.**

Onboard LAN Option ROM Select

Select iSCSI to use iSCSI Option ROMs to boot the computing using a network device. Select iSCSI to use PXE Option ROMs to boot the computing using a network device. The options are iSCSI and **PXE**.

Load Onboard LAN1 Option ROM/Load Onboard LAN2 Option ROM

Select Enabled to enable the onboard LAN1 or LAN2 Option ROM. This is to boot the computer using a network interface. The options are Enabled and **Disabled.**

▶Super IO Device Configuration

Uart 2 of Hermon as (Available on X8DTU-F Only)

Select COM to configure the onboard COM 2 port as a normal serial port. Select SOL to configure the onboard COM 2 port as a virtual COM port for SOL use. The options are **SOL** and COM.

Serial Port1 Address/ Serial Port2 Address

This option specifies the base I/O port address and the Interrupt Request address of Serial Port 1 and Serial Port 2. Select Disabled to prevent the serial port from accessing any system resources. When this option is set to Disabled, the serial port physically becomes unavailable. Select 3F8/IRQ4 to allow the serial port to use 3F8 as its I/O port address and IRQ 4 for the interrupt address. The options for Serial Port1 are Disabled, **3F8/IRQ4**, 3E8/IRQ4, 2E8/IRQ3. The options for Serial Port2 are Disabled, **2F8/IRQ3**, 3E8/IRQ4, and 2E8/IRQ3.

▶Remote Access Configuration

Remote Access

This allows the user to enable the Remote Access feature. The options are **Disabled** and Enabled.

If Remote Access is set to Enabled, the following items will display:

Serial Port Number

This feature allows the user decide which serial port to be used for Console Redirection. The options are **COM 1** and COM 2.

Serial Port Mode

This feature allows the user to set the serial port mode for Console Redirection. The options are **115200 8, n 1**; 57600 8, n, 1; 38400 8, n, 1; 19200 8, n, 1; and 9600 8, n, 1.

Flow Control

This feature allows the user to set the flow control for Console Redirection. The options are **None**, Hardware, and Software.

Redirection After BIOS POST

Select Disabled to turn off Console Redirection after Power-On Self-Test (POST). Select Always to keep Console Redirection active all the time after POST. (Note: This setting may not be supported by some operating systems.) Select Boot Loader to keep Console Redirection active during POST and Boot Loader. The options are Disabled, Boot Loader, and **Always**.

Terminal Type

This feature allows the user to select the target terminal type for Console Redirection. The options are ANSI, **VT100**, and VT-UTF8.

VT-UTF8 Combo Key Support

A terminal keyboard definition that provides a way to send commands from a remote console. Available options are **Enabled** and Disabled.

Sredir Memory Display Delay

This feature defines the length of time in seconds to display memory information. The options are **No Delay,** Delay 1 Sec, Delay 2 Sec, and Delay 4 Sec.

▶Hardware Health Monitor

This feature allows the user to monitor system health and review the status of each item as displayed.

CPU Overheat Alarm

This option allows the user to select the CPU Overheat Alarm setting which determines when the CPU OH alarm will be activated to provide warning of possible CPU overheat.

Warning! 1.Any temperature that exceeds the CPU threshold temperature predefined by the CPU manufacturer may result in CPU overheat or system instability. When the CPU temperature reaches this predefined threshold, the CPU and system cooling fans will run at full speed. 2. To avoid possible system overheating, please be sure to provide adequate airflow to your system.

The options are:

- The Early Alarm: Select this setting if you want the CPU overheat alarm (including the LED and the buzzer) to be triggered as soon as the CPU temperature reaches the CPU overheat threshold as predefined by the CPU manufacturer.

- **The Default Alarm**: Select this setting if you want the CPU overheat alarm (including the LED and the buzzer) to be triggered when the CPU temperature reaches about 5ºC above the threshold temperature as predefined by the CPU manufacturer to give the CPU and system fans additional time needed for CPU and system cooling. In both the alarms above, please take immediate action as shown below.

CPU 1 Temperature/CPU 2 Temperature/System Temperature

This feature displays current temperature readings for the CPU and the System.

The following items will be displayed for your reference only:

CPU1 Temperature/CPU2 Temperature

The CPU thermal technology that reports absolute temperatures (Celsius/Fahrenheit) has been upgraded to a more advanced feature by Intel in its newer processors. The basic concept is each CPU is embedded by unique temperature information that the serverboard can read. This 'Temperature Threshold' or 'Temperature Tolerance' has been assigned at the factory and is the baseline on which the serverboard takes action during different CPU temperature conditions (i.e., by increasing CPU Fan speed, triggering the Overheat Alarm, etc). Since CPUs can have different 'Temperature Tolerances', the installed CPU can now send information to the serverboard what its 'Temperature Tolerance' is, and not the other way around. This results in better CPU thermal management.

Supermicro has leveraged this feature by assigning a temperature status to certain thermal conditions in the processor (Low, Medium and High). This makes it easier for the user to understand the CPU's temperature status, rather than by just simply seeing a temperature reading (i.e., 25ºC). The CPU Temperature feature will display the CPU temperature status as detected by the BIOS:

Low – This level is considered as the 'normal' operating state. The CPU temperature is well below the CPU 'Temperature Tolerance'. The serverboard fans and CPU will run normally as configured in the BIOS (Fan Speed Control).

User intervention: No action required.

Medium – The processor is running warmer. This is a 'precautionary' level and generally means that there may be factors contributing to this condition, but the CPU is still within its normal operating state and below the CPU 'Temperature Tolerance'. The serverboard fans and CPU will run normally as configured in the BIOS. The fans may adjust to a faster speed depending on the Fan Speed Control settings.

User intervention: No action is required. However, consider checking the CPU fans and the chassis ventilation for blockage.

High – The processor is running hot. This is a 'caution' level since the CPU's 'Temperature Tolerance' has been reached (or has been exceeded) and may activate an overheat alarm.

User intervention: If the system buzzer and Overheat LED has activated, take action immediately by checking the system fans, chassis ventilation and room temperature to correct any problems.

> **Notes**: 1. The system may shut down if it continues for a long period to prevent damage to the CPU.
>
> 2. The information provided above is for your reference only. For more information on thermal management, please refer to Intel's Web site at www.Intel.com.

System Temperature: The system temperature will be displayed (in degrees in Celsius and Fahrenheit) as it is detected by the BIOS.

Fan 1 ~ Fan 8 Reading

This feature displays the fan speed readings from fan interfaces Fan 1 through Fan 8.

Fan Speed Control Modes

This feature allows the user to decide how the system controls the speeds of the onboard fans. The CPU temperature and the fan speed are correlative. When the CPU on-die temperature increases, the fan speed will also increase, and vice versa. Select Workstation if your system is used as a Workstation. Select Server if your system is used as a Server. Select "Disabled, (Full Speed @12V)" to disable the fan speed control function and allow the onboard fans to constantly run at the full speed (12V). The Options are: **Disabled (Full Speed)**, 4-pin (Server), 4-pin (Workstation), 4-pin (Quiet) and 4-pin (Super Quiet).

Voltage Monitoring

CPU1 Vcore, CPU2 Vcore, 1.5V, 5V, 5VSB, 12V, -12V, 3.3Vcc, 3.3VSB, VBAT and Vtt.

▶ACPI Configuration

Use this feature to configure Advanced Configuration and Power Interface (ACPI) power management settings for your system.

High Performance Event Timer

Select Enabled to activate the High Performance Event Timer (HPET) that produces periodic interrupts at a much higher frequency than a Real-time Clock (RTC) does in synchronizing multimedia streams, providing smooth playback and reducing the dependency on other timestamp calculation devices, such as an x86 RDTSC Instruction embedded in the CPU. The High Performance Event Timer is used to replace the 8254 Programmable Interval Timer. The options are **Enabled** and Disabled.

PS2 KB/MS Wakeup

Select Enabled to "wakeup" the system when you press the PS2 Keyboard or Mouse. The options are Enabled and **Disabled**.

ACPI Aware O/S

Select Yes to enable ACPI support for an operating system that supports ACPI. Select No to disable ACPI support for an OS that does not support ACPI. The options are **Yes** and No.

ACPI APIC Support

Select Enabled to include the ACPI APIC Table Pointer in the RSDT (Root System Description Table) pointer list.The options are **Enabled** and Disabled.

APIC ACPI SCI IRQ

When this item is set to Enabled, APIC ACPI SCI IRQ is supported by the system. The options are Enabled and **Disabled**.

Headless Mode

This feature is used to enable system to function without a keyboard, monitor or mouse attached The options are Enabled and **Disabled**.

ACPI Version Features

The options are ACPI v1.0, **ACPI v2.0** and ACPI v3.0. Please refer to ACPI's website for further explanation: http://www.acpi.info/.

▶IPMI Configuration (X8DTU-F Only)

Intelligent Platform Management Interface (IPMI) is a set of common interfaces that IT administrators can use to monitor system health and to manage the system as a whole. For more information on the IPMI specifications, please visit Intel's website at www.intel.com.

IPMI Firmware Version

This item displays the current IPMI Firmware Version.

Status of BMC Working

The Baseboard Management Controller (BMC) manages the interface between system management software and platform hardware. This item displays the status of the current BMC controller.

▶View BMC System Event Log

This feature displays the BMC System Event Log (SEL). It shows the total number of entries of BMC System Events. To view an event, select an Entry Number and pressing <Enter> to display the information as shown in the screen.

- Total Number of Entries
- SEL Entry Number
- SEL Record ID
- SEL Record Type
- Event Timestamp
- Generator ID
- Event Message Format User
- Event Sensor Type
- Event Sensor Number,
- Event Dir Type
- Event Data.

Clear BMC System Event Log

Clear BMC System Log

Select OK and press the <Enter> key to clear the BMC system log. Select Cancel to keep the BMC System log. The options are **OK** and Cancel.

Caution: Any cleared information is unrecoverable. Make absolutely sure that you no longer need any data stored in the log before clearing the BMC Event Log.

▶Set LAN Configuration

Set this feature to configure the IPMI LAN adapter with a network address as shown in the following graphics.

Channel Number - Enter the channel number for the SET LAN Config command. This is initially set to **[1]**. Press "+" or "-" on your keyboard to change the Channel Number.

Channel Number Status - This feature returns the channel status for the Channel Number selected above: "Channel Number is OK" or "Wrong Channel Number".

IP Address Source

This features allows the user to select how an IP address is assigned to a client computer or network device. Select DHCP (Dynamic Host Configuration Protocol) to allow a client (computer or device) obtains an IP address from a DHCP server that manages a pool of IP addresses and network information on a "request and grant" basis. Upon time-out (or lease expiration), the IP address assigned to the client can be reassigned to a new client. Select **Static** (Static Allocation) to allow the host server to allocate an IP address based on a table containing MAC Address/IP Address pairs that are manually entered (probably by a network administrator). Only clients with a MAC address listed in the MAC/IP Address Table will be assigned an IP address. The IP Address allocated to the client is on a longer term basis than that assigned by the DHCP mentioned in the other option. The options are DHCP and **Static**.

IP Address

The BIOS will automatically enter the IP address of this machine; however it may be over-ridden. IP addresses are 6 two-digit hexadecimal numbers (Base 16, 0 ~ 9, A, B, C, D, E, F) separated by dots. (i.e., 00.30.48.D0.D4.60).

Subnet Mask

This item displays the current subnet mask setting for your IPMI connection. The value of each three-digit number separated by dots should not exceed 255.

Gateway Address

The BIOS will automatically enter the Gateway address of this machine; however it may be over-ridden. IP addresses are 6 two-digit hexadecimal numbers (Base 16, 0 ~ 9, A, B, C, D, E, F) separated by dots. (i.e., 00.30.48.D0.D4.60).

Mac Address

The BIOS will automatically enter the Mac address of this machine; however it may be over-ridden. Mac addresses are 6 two-digit hexadecimal numbers (Base 16, 0 ~ 9, A, B, C, D, E, F) separated by dots. (i.e., 00.30.48.D0.D4.60).

▶SET PEF Configuration

PEF Support

Select Enabled to enable the function of Platform Event Filter (PEF) which will interpret BMC events and perform actions based on pre-determined settings or 'traps' under IPMI 1.5 specifications. Powering the system down or sending an alert when a triggering event is detected. The default is **Disabled.**

The following will appear if PEF Support is set to Enabled.

PEF Action Global Control (Available if the item-PEF Support is enabled)

These are the different actions based on BMC events. The options are **Alert**, Power Down, Reset System, Power Cycle, OEM Action, Diagnostic Interface.

Alert Startup Delay (Available if the item-PEF Support is enabled)

This feature inserts a delay during startup for PEF alerts. The options are Enabled and **Disabled**.

PEF Alert Startup Delay (Available if Alert Startup Delay is enabled)

This sets the pre-determined time to delay PEF alerts after system power-ups and resets. Refer to Table 24.6 of the IPMI 1.5 Specification for more information at www.intel.com. The options are **No Delay**, 30 sec, 60 sec, 1.5 min, 2.0 min.

Startup Delay (Available if the item-PEF Support is enabled)

This feature enables or disables startup delay. The options are Enabled and **Disabled**.

PEF Startup Delay (Available if the item-Startup Delay is enabled)

This sets the pre-determined time to delay PEF after system power-ups and resets. Refer to Table 24.6 of the IPMI 1.5 Specification for more information at www.intel.com. The options are **No Delay**, 30 sec, 60 sec, 1.5 min, 2.0 min.

Event Message for PEF Action (Available if the item-PEF Support is enabled)

This enables of disables Event Messages for PEF action. Refer to Table 24.6 of the IPMI 1.5 Specification for more information at www.intel.com. The options are **Disabled** and Enabled.

BMC Watch Dog Timer Action

Allows the BMC to reset or power down the system if the operating system hangs or crashes. The options are **Disabled**, Reset System, Power Down, Power Cycle.

BMC Watch Dog TimeOut [Min:Sec]

This option appears if BMC Watch Dog Timer Action (above) is enabled. This is a timed delay in minutes or seconds, before a system power down or reset after an operating system failure is detected. The options are **[5 Min]**, [1 Min], [30 Sec], and [10 Sec].

▶DMI Event Log Configuration

View Event Log

Use this option to view the System Event Log.

Mark All Events as Read

This option marks all events as read. The options are OK and Cancel.

Clear Event Log

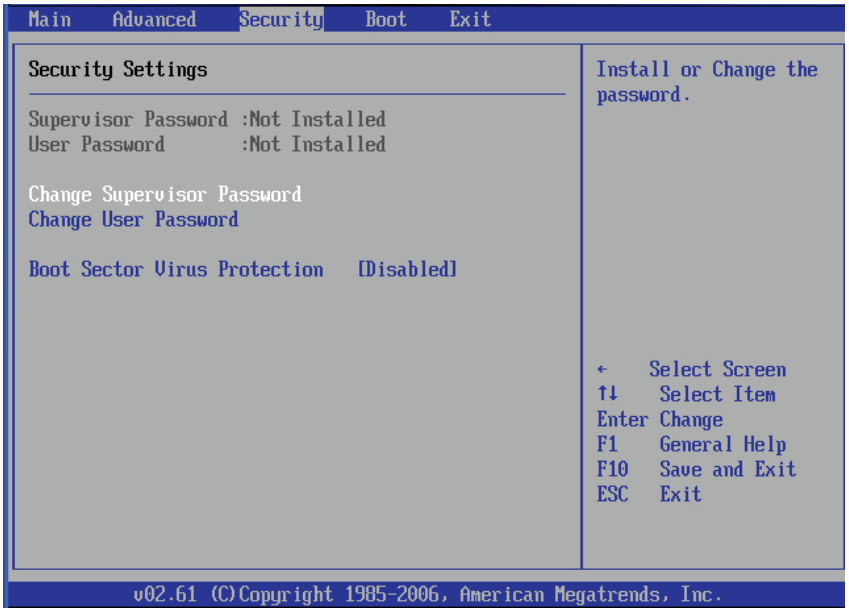
This option clears the Event Log memory of all messages. The options are OK and **Cancel.**

PCIE Event Log

Select Yes to activate and display the PCI-Express slot event log. The options are **Yes** and No.

7-4 Security Settings

The AMI BIOS provides a Supervisor and a User password. If you use both passwords, the Supervisor password must be set first.



Supervisor Password

This item indicates if a Supervisor password has been entered for the system. "Not Installed" means a Supervisor password has not been used.

User Password

This item indicates if a user password has been entered for the system. "Not Installed" means that a user password has not been used.

Change Supervisor Password

Select this feature and press <Enter> to access the submenu, and then type in a new Supervisor Password.

User Access Level (Available when Supervisor Password is set as above)

Available options are **Full Access**: grants full User read and write access to the Setup Utility, View Only: allows access to the Setup Utility but the fields cannot be changed, Limited: allows only limited fields to be changed such as Date and Time, No Access: prevents User access to the Setup Utility.

Change User Password

Select this feature and press <Enter> to access the submenu , and then type in a new User Password.

Clear User Password (Available only when User Password has been set)

This item allows you to clear a user password after it has been entered.

Password Check

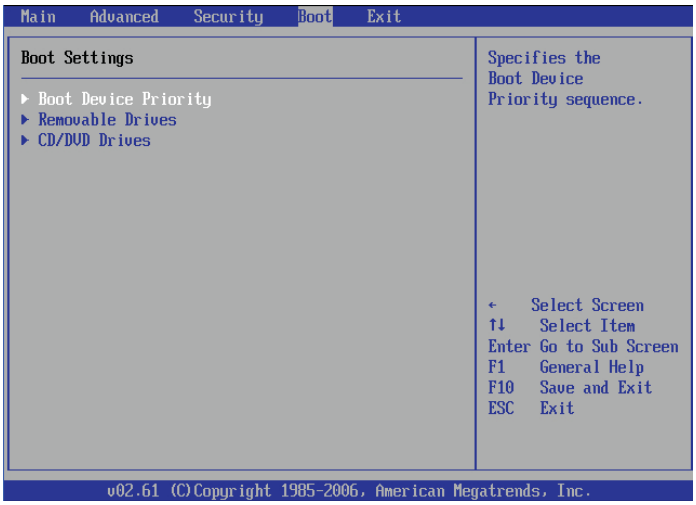
This item allows you to check a password after it has been entered. The options are **Setup** and Always.

Boot Sector Virus Protection

When Enabled, the AMI BIOS displays a warning when any program (or virus) issues a Disk Format command or attempts to write to the boot sector of the hard disk drive. The options are Enabled and **Disabled**.

7-5 Boot Configuration

Use this feature to configure boot settings.



▶Boot Device Priority

This feature allows the user to specify the sequence of priority for the Boot Device. The settings are 1st boot device, 2nd boot device, 3rd boot device, 4th boot device, 5th boot device and Disabled.

- 1st Boot Device - [USB: XXXXXXXXX]
- 2nd Boot Device - [CD/DVD: XXXXXXXXX]

▶Hard Disk Drives

This feature allows the user to specify the boot sequence from all available hard disk drives. The settings are Disabled and a list of all hard disk drives that have been detected (i.e., 1st Drive, 2nd Drive, 3rd Drive, etc).

- 1st Drive - [SATA: XXXXXXXXX]

▶Removable Drives

This feature allows the user to specify the boot sequence from available Removable Drives. The settings are 1st boot device, 2nd boot device, and Disabled.

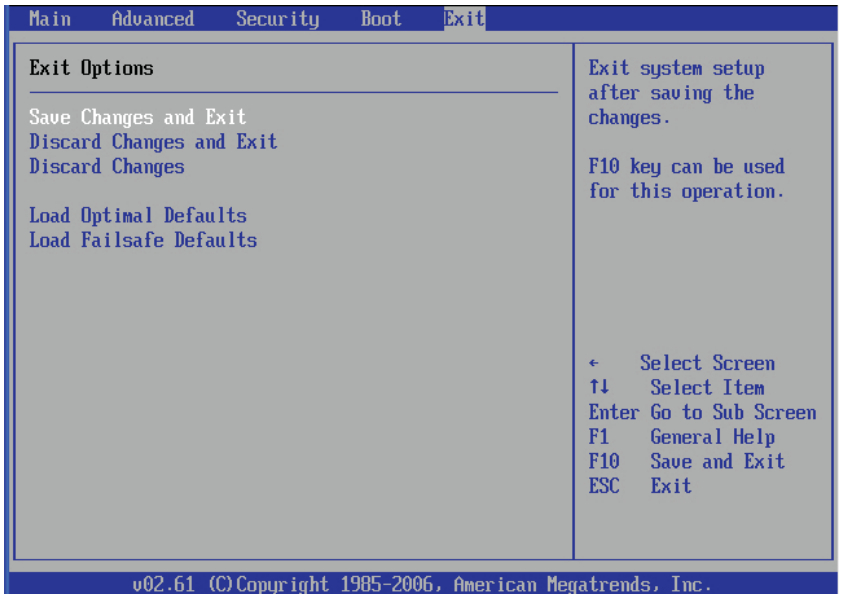
- 1st Drive - [USB: XXXXXXXXX]/2nd Drive

▶CD/DVD Drives

This feature allows the user to specify the boot sequence from available CD/DVD Drives (i.e., 1st Drive, 2nd Drive, etc).

7-6 Exit Options

Select the Exit tab from the Setup Utility screen to enter the Exit screen.


Main Advanced Security Boot Exit
Exit Options
Save Changes and Exit
Discard Changes and Exit
Discard Changes
Load Optimal Defaults
Load Failsafe Defaults
Exit system setup after saving the changes.
F10 key can be used for this operation.
← Select Screen
↑↓ Select Item
Enter Go to Sub Screen
F1 General Help
F10 Save and Exit
ESC Exit
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Save Changes and Exit

When you have completed the system configuration changes, select this option to leave the BIOS Setup Utility and reboot the computer, so the new system configuration parameters can take effect. Select Save Changes and Exit from the Exit menu and press <Enter>.

Discard Changes and Exit

Select this option to quit the BIOS Setup without making any permanent changes to the system configuration, and reboot the computer. Select Discard Changes and Exit from the Exit menu and press <Enter>.

Discard Changes

Select this option and press <Enter> to discard all the changes and return to the AMI BIOS Utility Program.

Load Optimal Defaults

To set this feature, select Load Optimal Defaults from the Exit menu and press <Enter>. Then, select OK to allow the AMI BIOS to automatically load Optimal Defaults to the BIOS Settings. The Optimal settings are designed for maximum system performance, but may not work best for all computer applications.

Load Fail-Safe Defaults

To set this feature, select Load Fail-Safe Defaults from the Exit menu and press <Enter>. The Fail-Safe settings are designed for maximum system stability, but not for maximum performance.

Appendix A

BIOS Error Beep Codes

During the POST (Power-On Self-Test) routines, which are performed each time the system is powered on, errors may occur.

Non-fatal errors are those which, in most cases, allow the system to continue the boot-up process. The error messages normally appear on the screen.

Fatal errors are those which will not allow the system to continue the boot-up procedure. If a fatal error occurs, you should consult with your system manufacturer for possible repairs.

BIOS Error Beep Codes

Beep Code	Error Message	Description
1 beep	Refresh	Circuits have been reset. (Ready to power up)
5 short beeps, 1 long beep	Memory error	No memory detected in the system
8 beeps	Display memory read/write error	Video adapter missing or with faulty memory
1 continuous beep (with the front panel OH LED on)	System Overheat	1 continuous beep with the front panel OH LED on

Notes

Appendix B

Installing Windows

After all hardware components have been installed, you must first configure Intel South Bridge RAID Settings before you install the Windows OS and other software drivers. To configure RAID settings, please refer to RAID Configuration User Guides posted on our web site at www.supermicro.com/support/manuals.

B-1 Installing the Windows OS for a RAID System

1. Insert Microsoft's Windows XP/2003/2008/Vista Setup CD in the CD driver and the system will start booting up from CD.

2. Press the <F6> key when the message "Press F6 if you need to install a third party SCSI or RAID driver" displays.

3. When the Windows OS Setup screen appears, press "S" to specify additional device(s).

4. Insert the driver diskette "Intel AA RAID Windows XP/2003/2008/Vista Driver for ICH10R" into the floppy drive and press the <Enter> key.

5. Choose the Intel(R) ICH10R SATA RAID Controller from the list indicated in the Windows OS Setup Screen, and press the <Enter> key.

6. Press the <Enter> key to continue the installation process. (If you need to specify any additional devices to be installed, do so at this time.) Once all devices are specified, press the <Enter> key to continue with the installation.

7. From the Windows OS Setup screen, press the <Enter> key. The Windows OS Setup will automatically load all device files and then, continue the Windows OS installation.

8. After the Windows OS Installation is complete, the system will automatically reboot.

B-2 Installing the Windows OS for a Non-RAID System

1. Insert Microsoft's Windows XP/Windows 2003/Windows 2008/Windows Vista Setup CD in the CD drive, and the system will start booting up from CD.

2. Continue with the OS installation. The Windows OS Setup screen will display.

3. From the Windows OS Setup screen, press the <Enter> key. The Windows OS Setup will automatically load all device files and then continue with the OS installation.

4. After the Windows OS Installation is complete, the system will automatically reboot.

5. Insert the Supermicro Setup CD that came with your serverboard into the CD drive during system boot, and the main screen will display.

Appendix C

System Specifications

Processors

Single or dual Intel® 5500 Series processors in LGA1366 sockets

Note: Please refer to our web site for a complete listing of supported processors.

Chipset

Intel IOH-36D/ICH10R chipset

BIOS

32 Mb AMI® SPI Flash ROM

Memory Capacity

Twelve DIMM sockets supporting up to 96 GB of registered ECC DDR3-1333/1066/800 SDRAM

See the memory section in Chapter 5 for details.

SATA Controller

Intel ICH10R on-chip controller for six-port Serial ATA (RAID 0, 1 5 and 10 supported)

Drive Bays

6016T-NTRF/6016T-NTF:
Four (4) hot-swap drive bays to house four (4) SATA drives
6016T-URF/6016T-UF:
Four (4) hot-swap drive bays to house four (4) SAS or SATA drives (requires optional UIO SAS or SATA controller card)

Peripheral Drive Bays

One (1) slim DVD-ROM drive

Expansion Slots

6016T-URF/6016T-UF:
Right side: (optional) 2x Gb LAN ports w/ RSC-R1UU-E8PR riser card and AOC-PG-i2+ add-on card
Left side: one UIO card and one PCI Express x16 slot
6016T-NTRF/6016T-NTF:
Right side: (optional) 2x Gb LAN ports w/ RSC-R1UU-E8PR riser card and AOC-PG-i2+ add-on card
Left side: two PCI Express x8 slots

Serverboard

X8DTU-F (Proprietary form factor)
Dimensions: 12 x 13.05 in (305 x 331 mm)

Chassis

6016T-URF/6016T-NTRF: SC815TQ-R650UB Form Factor: 1U rackmount
6016T-UF/6016T-NTF: SC815TQ-560UB Form Factor: 1U rackmount
Dimensions: (WxHxD) 17 x 1.7 x 25.6 in. (432 x 43 x 650 mm)

Weight

6016T-URF/6016T-NTRF: Gross (Bare Bone): 43 lbs. (19.5 kg.)
6016T-UF/6016T-NTF: Gross (Bare Bone): 41 lbs. (18.6 kg.)

System Cooling

Four (4) 4-cm heavy-duty counter-rotating fans

System Input Requirements

AC Input Voltage: 100-240 VAC
Rated Input Current: 8A (115V) to 4A (230V)
Rated Input Frequency: 50-60 Hz

Power Supply

6016T-URF/6016T-NTRF
Rated Output Power: 650W (Model# PWS-651-1R)
Rated Output Voltages: +5V (25A), +3.3V (12A), +12V (54A), +5Vsb (3A)
6016T-UF/6016T-NTF
Rated Output Power: 560W (Model# PWS-561-1H20)
Rated Output Voltages: +5V (25A), +3.3V (21A), +12V (43.6A), -12V (0.6A), +5Vsb (3A)

Operating Environment

Operating Temperature: 10º to 35º C (50º to 95º F)
Non-operating Temperature: -40º to 70º C (-40º to 158º F)
Operating Relative Humidity: 8% to 90% (non-condensing)
Non-operating Relative Humidity: 5 to 95% (non-condensing)

Regulatory Compliance

Electromagnetic Emissions: FCC Class A, EN 55022 Class A, EN 61000-3-2/-3-3, CISPR 22 Class A

Electromagnetic Immunity: EN 55024/CISPR 24, (EN 61000-4-2, EN 61000-4-3, EN 61000-4-4, EN 61000-4-5, EN 61000-4-6, EN 61000-4-8, EN 61000-4-11)

Safety: CSA/EN/IEC/UL 60950-1 Compliant, UL or CSA Listed (USA and Canada), CE Marking (Europe)

California Best Management Practices Regulations for Perchlorate Materials: This Perchlorate warning applies only to products containing CR (Manganese Dioxide) Lithium coin cells. “Perchlorate Material-special handling may apply. See www.dtsc.ca.gov/hazardouswaste/perchlorate”

Notes